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ORIGINAL MEMOIRS.

SOME CONSIDERATIONS IN THE TREATMENT OF FRACTURES OF THE LONG BONES.*

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THE question primarily is: Are we obtaining the most desirable results in the treatment of fractures of the long bones, in view of the appliances at our command in the way of aseptic technic and the unlimited advantages of the Röntgen laboratory, which to-day form an essential part of the armamentarium of our modern hospitals?

I cannot help feeling that we, as surgeons and teachers, are not fully utilizing our talents nor all of the advantages at our command. Neither are we devoting as much time and care as we should to the thorough instruction of students and internes in our schools and hospitals in this very important branch of surgery. Many at first may be disposed to question this statement, but I hope to elicit your thoughtful consideration of what, to my mind, seems most important.

* A part of the Presidential address before the American Surgical Association, June 19, 1911.

There is lack of interest and a feeling that the subject of fractures is so old that it will almost take care of itself. To-day other fields of surgery—for example, the abdomen, blood-vessels, and thorax—offer such a large and attractive variety of opportunities for original research and investigation, and the results are so brilliantly and quickly achieved, that it does not seem strange that the slow physiological processes pertaining to the repair of a broken bone should be relegated to the care of those whose time is less occupied, and who are willing to accept this responsibility of what they have been taught to consider a very humble and almost unimportant branch of surgery.

Teachers and surgeons generally appear to be apathetic, and are disposed to leave these cases to the care of assistants or house officers, and it is only after a case has progressed badly that sufficient interest is aroused to demand action on the part of the surgeon.

Not only is less time given to teaching this important and interesting subject, but the study of the clinical aspects of the case, which was thought so essential formerly for a correct diagnosis, has given way to the more easy laboratory findings. The student of fractures to-day feels that an X-ray report will reveal to him in a moment, and with less trouble, what a careful clinical study, requiring a much greater expenditure of time, would show.

Permitting this impression to grow in the minds of students has had its influence indirectly upon the treatment of fractures in general, and it is only too apparent that the rising generation is lacking in much of the skill and resourcefulness which characterized the older surgeons in the diagnosis and treatment of these injuries.

The older Fellows well remember how much time, care, and attention were formerly devoted by lecturers to the consideration of fractures; they formed, in fact, one of the most important topics in a course on surgery, which always embraced a very complete classification *of* and exhaustive instruction *in* the mechanism of fractures, the displacing element

played by the muscles, and what should be done to obviate and correct these displacements; and practical instruction looking to acquiring a thorough knowledge of the art of bandaging and how to apply accurately all forms of fracture dressings, first in the bandaging of mannikins, and later on of human subjects, so that the student was able to properly apply all sorts of roller bandages. He would have them applied to his own person and so form an accurate conception of the amount of pressure that is necessary to retain a splint to the injured part, or to control the spasms of an irritated or bruised muscle. Thus equipped and informed, the young surgeon, no matter how youthful his appearance, was able to convince his patients that he was at least master of this branch of surgery.

Contrast this with what we see in so many of our house officers to-day, many of whom have been appointed after a most vigorous competitive examination, in which they may have displayed enviable knowledge of bacteriology and hæmatology, and may have been able to cite quite glibly all of the intricacies of the Wassermann reaction, but who have hardly the slightest idea of how a splint should be padded or prepared for a fracture of the forearm, much less exactly how it should be applied; and (what is infinitely worse) when instructed, will invariably relegate this important part of the routine treatment of fractures to the ward nurse, who may be but little more advanced than the probationer.

It would appear to the careful observer that the surgeon of to-day depends too much upon laboratory findings, and that a careful clinical study of the aspects of a case is too frequently neglected.

For the X-rays, it must be said that our knowledge of fractures appears to have been limited before the year of its development, and, as the natural result of this marvellous invention, to have enormously advanced and the entire subject to have been transformed so that we have a new generation growing up who cannot consider fractures except in the light of a skiagraph, nor tolerate anything which partakes of the nature of the older methods of diagnosis.

Good X-ray work has been done in the last decade, adding much to the data on the subject of fractures, demonstrating that fractures occur in types—and very definite types at that. It has proved that many types which were supposed to be rare are common, as comminuted fractures of the lower end of the radius, fracture and luxation of the carpus, and fracture of the greater tuberosity of the humerus. It has disproved the prevalence of such injuries as coracoid fracture of the scapula and fractures of the acromion process.

It has placed and classified fractures about the elbow-joint, especially in children, and has demonstrated many of the injuries to be of an epiphyseal nature and not of the type of T-fracture so often seen in adults.

Thus, in teaching us *what* to look for, it also has, or should have, taught us *how* to look.

I do not wish for a moment to decry the use of the X-ray, but to consider the time and place for its employment. Much has been said about the importance of having every case skiagraphed for the purpose of making a diagnosis, and about its being criminal to omit the picture. To my mind, it is often unnecessary and impracticable, and may often inflict considerable hardship on the patient of limited means. It does little more than satisfy a certain curiosity without really adding data for the future management of the case. Of course, in obscure and special conditions, a preliminary skiagraph may be profitably employed, and should be. The X-ray in all its phases will prove an invaluable aid to study, a condemning judge to the careless surgeon, and a constant and inspiring stimulus to improved technic.

The time for the X-ray picture is after a thorough clinical study and accurate reduction have been made under an anæsthetic (if necessary), and appropriate dressings placed on the injured part. The skiagraph can then be taken, not primarily for the purpose of diagnosis, but for the assurance of an accurate and proper coaptation of the fragments.

In other words, the time to employ the X-rays is preferably after and not before reduction, thus acting as a check to diagnosis, correction of position, and prognosis.

I wish to emphasize the importance of having fractures skiagraphed in planes crossing each other at right angles, or else of having a stereopticon plate prepared, which is of great advantage. Otherwise many fractures will escape detection and leave the surgeon only clinical data for the future management of the case, which will be very embarrassing to the man who places absolute confidence in the result of his X-ray findings.

I feel that a general review of the subject cannot be dismissed without some reference being made to the so-called open treatment of simple fractures, as advocated by some of the more radical members of the profession, and so strongly advised by Mr. Lane, of London, and Dr. Huntington, of San Francisco.

In this respect, medical men to-day seem distinctly divided into three groups:

1. Those who never or rarely ever operate at all, who may be called the ultraconservatives.

2. Those who operate on nearly every case, who might be designated as extremists in this branch of surgery.

3. The conservatives, who operate on properly selected cases, after it is definitely proved that other methods of treatment are not expedient and that proper reduction cannot be accomplished nor the ends of the fragments held in position without some operative procedure.

From the first group, we get the greatest number of distinctly bad results and the largest number of suits for malpractice.

From the second group, if uniformly followed, we would undoubtedly have the greatest mortality.

From the third or more conservative group, we have, I think, the best results consistent with a low mortality.

The operative or open treatment of simple fractures is, in itself, a very large subject in which many things have to be

considered beyond the mere approximation of the ends of the bones and their permanent retention by some mechanical device, as catgut, tendon, wire, nails, plates, etc., and should only be considered for a class of patients that give promise of being good operative risks.

And, before going further, I want to pay tribute to the very excellent pioneer work done in this city (Denver) by our late colleague, Dr. Parkhill, who devised some ingenious clamps and screws for retaining in position the fragments in fractures of the long bones. His method has been slightly modified by some, but the far-seeing underlying principle still remains the same, and offers a very satisfactory and safe method for dealing with certain types of fractures demanding operative interference.

It stands almost without reasoning that, in order to obtain a good functional result after fracture, the ends of the bone should be brought in direct relation with each other, and most of the cases in which we fail to obtain union are those in which the fragments are widely apart and not infrequently separated by a fragment or spicule of bone, a tendon, a muscle, or piece of fascia. No satisfactory attempt at repair will take place until all barriers are removed by operation, the fragments retained in position by some mechanical device, and the limb kept at rest by means of suitable splints and bandages. Everything should be done to make the patient's physical condition the best, and, last but not least, the hygiene of the skin of the injured member should be kept in the highest state of efficiency by frequent ablutions of soap and water, alcohol, and light massage.

The time for operating, if found necessary, is either as soon after the injury as possible, and before the parts are infiltrated with serum and before muscular contraction has taken place, or after the inflammatory condition has subsided (which is usually during the second week). To wait longer involves much muscular contractions and adhesions, which add much to the technical difficulties of the operation. Moreover, distinct changes are occurring in the ends of the fragments,

which often tend to delay union by blocking up the bone channels with lime salts—a condition frequently seen, though oftener in cases of old ununited fractures.

I do not endorse the methods of my more radical friends who can hardly look at a fracture except in the light of an operation, and who use some form of metallic plate which is retained in position by drilling the bone and inserting screws, nails, wire, or some extraneous substance, for the following reasons:

If this entailed no risk or bad effects, this method would certainly offer all that could be desired, so far as the approximation and retention of the fragments are concerned. But by pursuing this method, as routine treatment, the patient has his simple fracture converted into a compound one (in itself always an element of risk). The ends of the fragments have to be dealt with rather vigorously by introducing screws for the plates, which have to be removed by a second operation, and the presence of these foreign bodies interferes with the bone's nutrition and frequently causes considerable necrosis and caries, which are disclosed at the time of their removal.

Before dismissing this branch of the subject, I wish to emphasize the importance of early operative interference in cases where the ends of the bones cannot be properly adjusted, or where there is danger of non-union, or where bad functional result follows the ordinary procedure. Where any of these conditions exists, the sooner the case comes to operation, the better for the patient.

It must be remembered that these operations are often most difficult, requiring a special type of instruments and a thorough surgical technic (which is not in the province of every man who considers himself a surgeon), and that the wounds are more prone than any other class of wounds to infection, and the risk to life and limb is thereby proportionately increased.

In conclusion, I want to try and bring to the minds of the Fellows of this Association the importance of more thorough instruction in the routine treatment of fractures in general by

men of large surgical experience, instead of relegating it to mere novices, because students are very astute and quickly grasp the relative importance of any subject by the class and character of men to whom its instruction is intrusted.

If this suggestion is faithfully carried out, a much smaller percentage of cases will be offering themselves for operation and less of our surgery will be reviewed in the courts for either real or imaginary lack of surgical skill.

THE TREATMENT OF FAR-ADVANCED MALIGNANT DISEASE. *

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ONE of the most perplexing and pathetic questions which confronts the surgeon is what to do for patients suffering from far-advanced malignant disease. We realize that the results obtained by early and radical operation are gratifying, and that it is only by such treatment that cures can be promised. It is obvious then that what we want is to have the patients come to us early and not as a last resort. Why do they not come early and why do they so often first consult the cancer quack? (I refer, of course, more particularly to the more ignorant class of patients, though such behavior is by no means rare among patients who consider themselves intelligent.) In order to answer this question I have asked many patients to explain their delay and their obvious dodging of the surgeon, and I have discovered that there is a wide-spread belief among the laity that surgery is of no avail in the face of cancer and that it should only be employed when other means of treatment have failed. Probably in no surgeon's office, and certainly in no surgical dispensary, is the following statement rare, "If it is cancer, I do not want it operated upon, but if it is a simple tumor I am willing to have it removed." On being asked to explain his attitude the patient tells us that he knows of several cases, often one or two in his own family, where recurrence took place promptly after operation. He does not understand that the operation was probably a late one, and draws his conclusions only from the result accomplished by the operation. Unfortunately the patient sometimes gets bad advice from his

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medical attendant, who lacks courage enough to say as soon as the growth is discovered that a surgeon should be consulted and wastes valuable time in applying ointments and giving placebos.

Many general practitioners share the belief I have accredited to the laity that surgery is of no avail in the treatment of malignant growths, and this belief has its origin in the contemplation of early recurrences after late and incomplete operations. These practitioners are often forced by their own consciences or by the importunities of the patient to bring him for operation when the disease has advanced beyond relief. There can be no doubt whatever that this want of faith in surgery is prevalent in the laity and to a small extent in the profession, nor is there any doubt in my mind that it has its origin in the knowledge of the results obtained by operation in far-advanced cases. It seems to me, therefore, that as surgeons it is our duty to correct this false impression and substitute for it the truth, which is that cancer is curable if accessible and if operated upon early and thoroughly.

Many will say that we are certainly preaching this, and I admit it, but our practice very often counteracts the effect of our preaching. A poor patient presents herself, or is brought by her physician, with a far-advanced cancer of the breast with extensive glandular involvement, a condition which we recognize as being beyond operative relief, but out of sympathy for the sufferer, or with the vague hope that operation may relieve suffering or perhaps prolong life, or because the physician has told the patient she must be operated upon and persuaded her to consent, we operate, doing a most extensive removal of the original growth but finding too often that the glandular involvement is beyond removal, or worse, that metastasis to some other inaccessible part has already occurred. What is the result in such a case? The patient recovers from the operation, goes home, thinks she is cured, and she and her friends spread the news that she has been operated upon. In a few months the disease has killed her and all her friends and acquaintances make the natural deduction that surgery

cannot cure cancer. When one of these develops a similar condition operation is postponed until the same hopeless stage is reached and then operation is sought as a last resort. This, I take it, is the wrong way to teach the laity what surgery can do and thwarts our object—namely, that of getting the cases early.

Let us, for example, take this same type of case again and say honestly to the patient or her family and to her physician that the disease has progressed too far for operation. What will be the effect on the physician and on his patient of such an attitude? On the physician, if he is conscientious and honest, it will be that of stimulating him to bring his cases of tumor to us at an earlier date. The patient and her friends spread the news that she applied too late for operation, and she succumbs to the disease possibly a little earlier than if she had been operated upon. But the effect upon her circle of acquaintances is that when one of them develops a similar growth she will hasten to the surgeon lest she, too, may be told that the disease is beyond any hope of surgical relief. The public must be taught and this is one way we can do it.

It will be said that by this plan we are arbitrarily sacrificing the individual for the benefit of the race, because we cannot say how far the disease has advanced until we operate, and that occasionally cures are accomplished when least expected. I believe that with careful physical examination and thorough study of statistics we can pick out the cases which are apt to give us the pleasant surprises. We all realize that there are certain types of malignant tumor which grow slowly and metastasize late, and in such, even if far-advanced, cure or a long period of freedom from disease may be accomplished. But these are not the cases I would reject. On the other hand, we have types of carcinoma, like that of the uterus and the rectum, especially in young people where only early operation can be of avail. An examination of the liver through an abdominal incision has more than once saved me the chagrin of resecting a rectum for cancer when the liver was already extensively involved in the disease. We know that a slow-grow-

ing cancer of the breast in a woman past fifty years of age, even if the skin is extensively involved, gives often a fair operative result, and we know, equally well, that it is useless to operate on a far-advanced rapidly-growing breast cancer in a young woman.

My feeling in regard to this matter is that for extent and thoroughness operations for cancer have reached their limit, and our improvement in the treatment of this disease must come through impressing the public and the profession with the idea that malignant disease must be attacked early and radically if it is to be treated successfully, and that one of the ways of doing this is to avoid operation, except those of absolute necessity, in cases which our experience and judgment tell us are so far advanced that there is only a small hope of temporary relief. By declining operation in the hopeless cases we stimulate those physicians who refer their patients to us to greater effort at early diagnosis, and we impress the laity with the fact that it is an early operation which cures cancer. To operate upon a far-advanced cancer of the rectum, with probable hepatic metastasis, means an early death accredited to futile surgery, while to turn such a case down with the statement that it is too late throws the onus where it may rightly belong, on the patient himself or on the physician who may have been giving him his " favorite pile ointment " without having once examined the interior of the rectum. In how many cases of cancer of the rectum do we find that a recent operation for hemorrhoids has been done? Improvement in the treatment of these cases must come, it seems to me, by early and complete operation and not by carrying our already extensive operative procedures still farther. The following is an illustration of the point I would make and I am sure it can be duplicated in the experience of most surgeons. Last winter I was foolish enough, out of sympathy for the patient and because of the importunities of the husband, to operate on a rapidly-growing adenocarcinoma of the breast, which for six weeks had been daily " rubbed " by an osteopath, who told the patient that although the treatment might not cure her

it would put the parts in better condition for operation later. When I first saw her it looked as if the breast were the seat of an enormous abscess and the axillary and cervical glands were extensively involved. The suffering and distress were so great that I yielded to the hope that an extensive operation followed by X-ray treatments might, at least, bring relief. Recurrence took place in three or four months and the patient died in six or eight months. How many of the acquaintances of this poor woman do you think believe that she died because "surgery cannot cure cancer," how many do you suppose know of the previous treatment, and would not my refusing to operate, because of the previous maltreatment, probably have had a restraining effect in the future on the person administering it?

In checking fire dynamiting and counter-firing may be of avail sometimes, but the surest way is to put out the fire in the beginning and the same applies to the treatment of cancer.

EXTIRPATION OF TUMORS OF VOMER THROUGH THE ROOF OF THE MOUTH.*

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TUMORS of the nasal and nasopharyngeal regions are of common occurrence, but fortunately most of them are benign in character. Adenoids belong to this non-malignant group and occur frequently in children. Later in life the fibromata and the much more numerous polypi are seen.

Many types of operations have been recorded for the removal of malignant diseases in the nose (sarcoma and carcinoma), nearly all of these operations being purely nasal procedures through the normal openings, and, peculiarly enough, the success of such procedures, often admittedly incomplete in the reported cases, is quite as favorable as regards freedom from recurrence as are the operations for simple tumors performed in the same manner.

Infection following those operations appears to be a factor in delaying recurrence, especially in malignant disease, although many of the cases were reported soon after the operation was completed. Undoubtedly intranasal operations skilfully performed may destroy or remove large tumors which spring from the pharynx, lateral wall, and septum.

There are tumors, endothelial and sarcomatous in structure, which develop in and destroy existing tissue, such as the vomer. No benefit will be derived in these cases from the use of the snare or forceps, which are the instruments commonly employed for the removal of intranasal growths.

The early symptoms manifested by tumors of the vomer are nasal obstruction and the consequent changes in the voice. The offensive discharges accompanying malignant disease of the nose are of late occurrence, and when the vomer is involved the discharge does not appear until the structure is destroyed or replaced by ulceration of the diseased growth. Local pain or deafness has not been a marked feature of these cases.

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Abnormal thickness of the septum is noted, and when this extends anteriorly may be mistaken for septal abscess. The pain, elastic touch, and more acute condition of abscess, however, differ from the slower invasion of malignant disease. The posterior enlargement of the septum can be felt with the examining finger and seen with the reflection in a mirror. One of the reported cases developed a rigid thickening in the roof of the mouth beneath the vomer.

In examining tumors of the vomer, the pathologist should insist that the tissue removed for microscopic examination be deep enough to secure real tumor tissue which will show the characteristics of the growth, otherwise the specimen may show but normal, or at most inflammatory, mocosa.

Metastasis, as a rule, is a late symptom, and when it is present few patients can be improved in health or have their lives prolonged by radical surgery. In such cases the use of Coley's [1] toxins and, in addition, the ligation with excision of the external carotid arteries for starvation of the growth, as advocated by Dawbarn,[2] may prove of some benefit with or without local treatment.

With regard to the benefit to be derived from Coley's toxins: We believe that they are indicated in such cases of nasal malignancy, after the diseased growth has been removed by operation, and not, as has been done so often, reserve the procedure for inoperable cases only, or wait for a recurrence of the growth. In a few instances excellent results have been reported by injections into the tumor; for example, formalin, arsenic, alcohol, adrenalin, etc.

The methods of approach in removing nasal tumors other than by the anterior or posterior normal openings are as follows: Displacing the external nose and cartilage upward by an incision within the lip similar to the route advocated by Halsted [3] and Kanavel [4] in the approach to the hypophysis. In order to secure additional room the upper jaws may be divided and separated, to be reunited by wire or splint, as advocated by Gussenbauer [5] for removal of nasopharyngeal growths. Many operations through external incision have been advocated: lateral incision, turning the nose over to one

side (Loewe [6]), horseshoe incision on both sides and across upper bridge, turning the nose down, are some of the methods recommended.

Boeckel's [7] angular incision at the side of the nose, opening the nostril and extending outward beneath the eye, gives good exposure. By extending the incision to the eyebrow past the internal canthus the operation is converted into that of Moure's[8] which is of value when more room is desired and is much less mutilating than most operations through an external excision.

In operating through the mouth, Nélaton [9] makes an incision in the midline along the hard and soft palates with resection of the bone. The soft palate is completely divided.

In two cases of malignant disease of the vomer, each with a pear-shaped enlargement of the septum which completely closed the posterior nares, we were able to remove the growth through the roof of the mouth by the removal of a section of the bone one inch long and three-fourths of an inch wide. In neither of these cases was it necessary to sever the soft palate as advised by Nélaton—a procedure which complicates the technic of the operation and the after care of the patient.

In preparation for the operation, it is advisable to give the patient 30 to 50 grains of urotropin 24 to 48 hours preceding the operation, as it undoubtedly aids in preventing meningeal infection. In the two cases which were operated in our clinic at St. Mary's Hospital, the patients were given ether to profound anæsthesia following the preliminary hypodermic of 1/150 grain of scopolamine and ¼ grain of morphine, given two hours before operation to secure the full effect of the scopolamine.

The resection of the central posterior half of the hard palate is made by midline incision with preservation of the mucoperiosteum and soft tissues. The position of the patient being the reverse Trendelenburg, at this stage of the operation, the head of the table is lowered with the head back in the Rose position, which prevents the blood from aspirating into the trachea. The septum is rapidly removed with bone cutting scissors and curette, and the space packed with gauze. The hemorrhage is

FIG. 1.

Bone removal. Tumors of vomer.

FIG. 2.

Tumor of vomer. Posterior view.

quite free during the operation, requiring constant sponging or a sucking apparatus for its removal. The primary gauze pack may be removed within a few minutes and the area of superior attachment of the vomer cauterized with a Paquelin. The nasal space is then packed with benzoated gauze, which is removed on the third day. According to the extent of the disease, some cases may be treated best by immediate suture of the mucoperiosteum, as in a cleft palate operation, while in others it may seem best to maintain the opening, for a time at least, for observation and treatment. Both of these methods were followed in the cases reported herewith.

CASE A41472.—Mrs. H. A. C., aged fifty-six years. Examination July, 1902. Nasal obstruction, and change in voice, due to the condition. Diagnosis: tumor in vomer area. Operation, Jan. 29, 1903: Resection of bony palate in roof of mouth. Preservation of soft palate. Removal of vomer. Cautery to area of superior attachment. The opening left for observation was covered by plate with teeth which the patient wore. Pathologic report: sarcoma.

Patient remained well seven years, then died of carcinoma of the intestines following an illness of several months.

CASE A49321.—E. McD., male, aged sixteen years. Examination Feb. 15, 1911. For five months has had discharge from the nose with obstruction. Tumor occupying vomer area. Diagnosis: sarcoma of septum. Operation, Feb. 25, 1911: Removal of tumor through roof of the mouth. Bony resection with preservation of soft palate. Pathologic report: fibrosarcoma.

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PYLOROPTOSIS; GASTRIC ATONY AS THE ORIGINAL CAUSE OF NEURASTHENIA, AND ITS CURE.*

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LESS than one year ago we decided to make a series of X-ray investigations of the stomach, to determine its size, position, and motility. As the digestive act is always performed while the patient is in the upright position, we decided to take pictures while the patient was standing. In these pictures a preparation of bismuth oxychloride has been used, because it has been demonstrated that the gastric secretions have no chemical action on this form of bismuth, and the influence of the normal acidity on the pyloric contraction is therefore present, and, most important, there is no danger of poisoning when using this drug. We were surprised to find that all of our pictures showed the stomach hanging vertically down in the abdomen, hung from the œsophageal opening, slightly curved to the right at the bottom like a big letter J. (Fig. 1). The anatomical description of the stomach as usually given is correct when the patient is lying down, but gives no idea of the great range of motility of the organ. The anatomists have been working at a great disadvantage, because they have been studying the stomach in post-mortem specimens. It must be remembered that a living stomach is different from the dead flaccid sac seen in the post-mortem room. Surgeons, too, have been at a disadvantage, because they have studied this organ when the patient was supine, lying on the operating table. We can also readily see that the administration of an anæsthetic with its consequent nausea would probably change not only the position of this organ but also its shape. The pyloric end is described as usually crossing the spinal column at the first lumbar vertebra, and this is

* Read before the American Surgical Association, June 21, 1911.

probably true when the patient is supine, but when in the upright position we find it frequently crossing at the fifth lumbar.

The ordinary method of determining the position of the stomach in the abdomen is by inflating it with gas or air, but we can readily see that inflation would make the organ rise in the abdomen, much like an inflated bladder in a barrel of water.

Hallings showed some time ago that the stomach is supported by the intestines and that they have in the abdomen about the same specific gravity as water.

In the pictures of all of these stomachs it is noticeable that there is a constriction of the circular fibres about half way between the pylorus and the fundus, giving an hour-glass effect, and while we cannot demonstrate any increase in the circular muscular fibres at this point, it is possible that this may in some way be related to the antral sphincter, which divides the stomach in half, in lower animals. Several observers have, we believe incorrectly, described these normal stomachs as hour-glass deformities.

Early in our investigations we found that many stomachs were very markedly prolapsed but that their owners had perfect digestions. Gastroptosis without symptoms was an explanation offered, but when we found that most healthy women and many healthy men had stomachs hanging well into the pelvis, we came to the conclusion that in the upright position the pylorus was usually a pelvic organ. When we came to take pictures of the neurasthenic patient, we at once found that the stomach was in the same position but flaccid, baggy, and flattened at the pylorus, showing marked lack of tone of the stomach wall; and we soon discovered that the most of these people without tone had been operated upon for removal of the appendix, but that they still had their right-sided pain and tenderness. As their appendices had been removed and the upper point of tenderness did not correspond with the position of the gall-bladder, we were at a loss to explain their attacks of colicky pains in the right abdomen. Later several of these people came to us from other

medical men with the diagnosis of chronic appendicitis, desiring operation. Several already observed were our own cases where removal of the appendix had failed to effect a cure. They were usually of the neurasthenic type so well described by Reynolds before this society one year ago. Many of them had discovered for themselves that their discomfort, which came about one hour after eating, could be relieved by lying down, which we believe is a valuable point in making a differential diagnosis.

When we found that young children had these same atonic stomachs without other prolapsed viscera, we commenced to understand the course of events at least in a certain class of early neurasthenias.

The digestive function of the stomach is, we believe, chiefly mechanical rather than chemical; a storehouse for food and an organ for churning and grinding of the food, so that it may be ready for the really important intestinal chemical digestive processes. Now as we look at a dilated prolapsed stomach, and realize that when the patient is in an upright position the stomach, after it has prepared the food, must lift it over the duodenal hill at least some five inches in height before any real digestion can take place, we realize that its muscular power must be up to normal, or the patient will commence to be uncomfortable and will as a result starve himself and so will soon lose weight.

This, in truth, is just what happens whenever the child or grown person loses flesh or strength from any cause and becomes weak and debilitated. Under these circumstances the stomach wall relaxes, the pyloric end sags, and the food cannot be lifted into the duodenum. Fermentation commences and the digestion becomes painful. Distinct attacks of pain are frequent; the greatest distress, as we have said, is usually referred to the right abdomen, at first one or two hours after eating, later the discomfort becomes constant, spreading all over the abdomen, sometimes with nausea, occasionally with vomiting. This distress almost never comes at night, and is often relieved by eating, more frequently by lying down, especially if the patient lies on the right side.

When the digestion becomes painful the patient starves himself, or more often herself, and so aggravates and intensifies the condition, rapidly drifting into the condition which we speak of as true neurasthenia. Stiller thinks that these conditions are congenital. The fact that these people can be so easily cured proves to us that they are not congenital. They undoubtedly inherit a weak constitution or a favorable soil for the growth of all these complex nervous symptoms. Whether congenital or acquired, we think we have seen the earliest signs or the first stages of neurasthenia in this stomach atony in young children who, by the way, react much more promptly than adults to intelligent treatment; so that for a time at least we have been able to put off the evil day. Goldthwait appears to think that some of these cases are due to postural errors, whereas we believe that the faulty attitude and carriage are late symptoms of the general relaxation due to starvation.

In regard to the etiology of this condition, we believe that gastric atony is closely allied to acute dilatation. Payer has recently described the milder forms of acute dilatation, which often pass unrecognized. We believe that after illness, shock, grief, etc., occasionally a mild acute paresis of the stomach will occur, which if unrecognized and untreated passes on into a chronic type, which we see in these typical neurasthenic atonic stomachs.

Treatment.—The observations of Makovic and Perussia (*Medical Klinik,* 1910) showed that position has a most marked influence in accelerating or retarding the passage of food from the stomach, making an increase of almost three hours in the emptying of the stomach when the patient was lying on the left side as against the same position on the right side. Consequently in dealing with these people the first thing to do is to describe to the patient the condition as shown in the picture and tell him the results that he may hope for if he will help to empty his own stomach by lying down on the right side when he has pain.

The internal medical man and the neurologist have for years been able to make most satisfactory cures of these

patients. They have known that the rest cure, with a special nurse and several weeks' stay in the hospital, would cure these patients, but it seems to us that they have not quite understood why they got such good results. Later when these patients had recovered, many of them relapsed because they were not properly instructed as to their future behavior.

But what is to be done for the working woman, for the shop-girl, who cannot afford all of these luxuries? Must she be abandoned to her fate? We believe that we have very materially helped a considerable number of these people without a formal rest cure and without medicine, and usually without an operation. If an operation has to be performed for some absolute physical or mechanical condition which interferes with the nutrition of the patient, she should be kept a much longer time in bed, and during her convalescence should be started on the line of forced fat feeding. After an operation it is always a mistake to let these people go home too early.

In regard to operations upon the stomach itself, if we are correct in our interpretations of these stomach plates and if the symptoms in these cases are due to loss of normal muscular power, as we believe them to be, then it would seem as though gastro-enterostomy, gastroplication, and gastro-suspension would accomplish little if any good, because operations upon the stomach itself will not increase the muscular strength of this organ, and the few days of operative starving will take away a little more flesh and strength and make the general condition worse.

We have tried gastroplication of the stomach by putting two or three rows of silk suture across its long axis, raising temporarily the site of the pylorus. A second picture taken a few weeks later showed the stomach to be of much the same size and practically in the same position as before the operation. These patients were a little better, but we believed that the improvement was due to the rest cure and the forced feeding, rather than a result of the operation. We have seen several of these stomachs where gastro-enterostomies have been done with no benefit. Some of them were our

own failures, done at a time when gastric ulcers were supposed to be multiple and when calloused ulcer was supposed to be the exception, not the rule. If gastro-enterostomy is ever justifiable in these cases, Bach is no doubt correct when he claims that the ordinary short loop operation only kinks the intestinal opening, and that if any operation is done it should be the Roux enterostomy *en Y*. At present, however, we believe that these people do not do well after any operation, that they are medical and not surgical in character.

In regard to gastrosuspension, we have seen some which did not hold, as for instance Case II reported in this paper. Eve, Rovesing, and Beyea all regard this neurotic condition, which we have been discussing, as a consequence of the gastroptosis or better pyloroptosis, but they all express the opinion that gastropexy should be done in these cases and that this operation will cure the disease. Our observation, in this as in other fixation operations, is, that when we suture living tissue, and especially muscular organs like the large intestine or the stomach, any suture which is strong enough to hold is almost certain to cut through in a few days, letting the organ soon fall back into its former position. Recently we tried to fasten a dilated obstructed cæcum into the abdominal wound for the purpose of making a fecal fistula; the stitches had all cut out the next day, and the intestine had drawn back into the abdominal cavity. Gerster, in the last "Progressive Medicine," believes that the American surgeon is not ready to accept gastropexy as a cure for pyloroptosis. On the other hand, without any operation we have seen most marked improvement in many of these patients. These people are easily affected by a faith cure, but imagination will not make them put on flesh. We subjoin two cases in illustration of these conclusions.

Case I.—Mrs. K. was curetted for dysmenorrhœa ten years ago. Eight years ago she still had dysmenorrhœa, right sided, and backache. She had a retroverted uterus and was markedly tender over her appendix; at that time I removed the appendix, which contained four good-sized enteroliths, and she was better for a time, although her right-sided dysmenorrhœa continued as

before. She was soon after married, and in February, 1904, her first baby was born. This relieved her of her dysmenorrhœa, but she continued to have such marked gastric trouble, with gas and vomiting attacks, that four years ago she had a gastro-enterostomy. This so increased her discomfort, that two years ago Dr. M. unfastened the gastro-enterostomy and suspended the stomach with two linen sutures, fastening the gastrocolic omentum to the suspensory ligament of the liver. When she came to us four months ago she was a nervous wreck, unable to do her work, almost insane from neurasthenia. The X-ray showed the typical prolapsed atonic stomach, which could not empty itself. Forced fat feeding and rest after meals changed this picture, so that in four weeks she gained eight pounds and said, "I am well, I have not felt like this for years." Her stomach was practically in the same location that it was before her cure.

Case II.—Mrs. G., aged forty-six, mother of three children; youngest child seventeen years of age. She was a tall, angular, thin, anæmic neurasthenic. She was 5 ft. 9 in. in height, weighed 118 lbs. For many years she had suffered from frequent attacks of vomiting of large quantities of fluid, mixed with blood on two occasions. Her stomach was very low and markedly atonic, as shown in Fig. 3. After two months very indifferent postural treatment by herself, she gained 16 lbs. and regained her tone, as shown in Fig.4.

In conclusion we believe:

First, position of the stomach is not important, that the pylorus is practically a pelvic organ.

Second, the principal function of the stomach is mechanical.

Third, the beginning or first symptom of the so-called neurasthenia is due to gastric atony.

Fourth, postural drainage and fat feeding, temporarily at least, cures these patients.

Fifth, from our present experience, we believe that operations on the atonic stomach to change its position and help its drainage have still to be proven advisable, because no operation will take away the muscular atony but will rather aggravate it.

FIG. 1.

Normal stomach.

FIG. 2.

Case I.

FIG. 3.

Case II.

FIG. 4.

Case II. Taken four months after Fig. 3. Stomach regaining tone

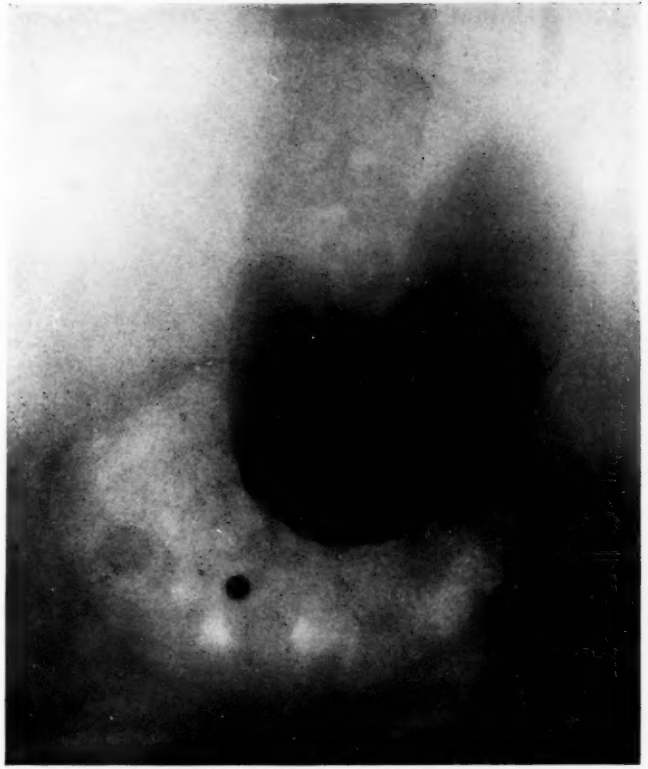
Fig. 5.

Mrs. B. (patient of Dr. C. L. Greene). Neurasthenic.

Fig. 6.

Same patient as shown in Fig. 5; taken 6½ hours later. Shows large portion of bismuth meal remaining in lower part of stomach.

Fig. 7.



Mrs. M. Had been operated on for chronic appendicitis. Figure shows gastroptosis and gastric atony.

Fig. 8.

Mrs. M. Same patient as shown in Fig. 7. Taken after gastroplication and prolonged rest cure. Shows stomach has regained its tone.

FIG. 9.

Child aged fourteen years. Shows gastroptosis and gastric atony; cured by one month's forced fat feeding.

ULCER OF THE STOMACH AND DUODENUM WITH SPECIAL REFERENCE TO THE END RESULTS.*

BY WILLIAM J. MAYO,

OF ROCHESTER, MINN.

On January 17, 1911, we (C. H. and W. J. Mayo) completed a series of 1000 operations upon the stomach and duodenum for indurated ulcer. The total number of cases operated for ulcer was considerably more than 1000, but the only ones considered in this study were those in which an actual demonstrable ulcer existed, that is, one that could be seen and felt in the stomach or duodenal wall. All of the so-called clinical, medical, and mucous ulcers have been excluded because of insufficient evidence of the actual presence of an ulcer.

The question as regards the existence of a group of ulcers in the stomach and duodenum, chronic in character, which are non-indurated and confined to the mucous membrane, must still be held *subjudice*. That acute mucous ulcers exist as a result of toxic poisons cannot be doubted, but all the evidence which we have at hand goes to show that acute ulcers heal if the patient does not succumb meanwhile to perforation or hemorrhage.

These acute ulcers and mucous erosions are almost always multiple and are caused by a variety of gastrotoxic substances. Toxic erosion of the gastric mucosa is the usual cause of the gastric hemorrhages which accompany cirrhosis of the liver, splenic anæmia, and certain disordered blood states.

Acute mucous ulcers apparently do not give rise to the chronic indurated ulcers; at least in going over the histories of the indurated ulcers which we have operated, few, if any,

* Read before the American Surgical Association, June 21, 1911.

could be traced to this acute condition. Nevertheless, I suspect that mucous ulcers, fissures, or erosions of a chronic character may exist and show no evidence of their existence on the exterior of the stomach, but such conditions must be rare. On several occasions we have examined the stomach and duodenum through an abdominal incision without finding any evidence of ulcer, and the continued symptoms for some months led to a second exploration when an ulcer was discovered. Either the ulcer had been overlooked at the primary operation or it had been confined to the mucous membrane, and the musculoperitoneal coats were involved later. This is a question which must be cleared up by further investigation; but until we can secure stronger clinical evidence than is now at hand, an ulcer must be demonstrated by sight and touch before its existence can be regarded as proven.

In a few instances we have incised the wall of the stomach and searched the gastric mucosa for mucous ulcer, but the results were rather uncertain. The gastric mucosa bleeds easily on manipulation, and the question arises: Was the lesion which was found in the mucous membrane caused by the instrumentation or was it present before the examination?

The proximal duodenum above the common duct is embryologically, functionally, and pathologically closely related to the stomach, although morphologically it has the appearance of the small intestine. Its mucous membrane is thin and granular, without valvulæ conniventes, and it does not have any great degree of muscular action. I have seen muscular contraction in the stomach and practically all parts of the intestinal canal, but I have never seen a peristaltic wave in the first four inches of the duodenum.

That benign ulcer was a disease of the stomach and rarely found in the duodenum was a dictum accepted until within recent years. Of the 1000 cases in our series, 428 were classified as gastric and 572 as duodenal. This is not a fair relative percentage, because the earlier cases in which an ulcer was found in the vicinity of the pylorus were classi-

fied as gastric, and in all probability many of them were duodenal in origin.

Previous to June 1, 1906, 379 cases of gastric and duodenal ulcer were operated. Of these, 227 (59 per cent.) were classified as gastric, and 152 (41 per cent.) as duodenal; *all of the ulcers around the pylorus being classified as gastric.*

From June 1, 1906, to January 17, 1911, 621 cases of gastric and duodenal ulcer were operated, of which 201 (32.5 per cent.) were gastric, 401 (64.5 per cent.) duodenal, and 19 (3 per cent.) were shown to have an ulcer of each viscus. That at least two out of three cases of ulcer will be found to have their origin in the duodenum rather than the stomach is a conservative estimate.

That benign ulcer was more common in women than in men was another almost universally accepted statement. Of our 1000 cases, 255 were women and 745 (practically three out of four) were men.

Another erroneous opinion tenaciously supported concerned the number of ulcers present in the involved organ, it being alleged that multiple ulcers were the rule. While this is quite true of acute toxic ulcers, it is certainly not true of the chronic indurated ulcer, more than 95 per cent. of which are single.

A study of the symptomatology of gastric and duodenal ulcer demonstrates that the greater number are situated within two inches of the pylorus, and that all of these ulcers give a fairly definite clinical picture; pain coming on from one to three hours after meals, often in the night, and relieved by taking food, alkalies, etc. In the early stages hyperacidity is a fairly constant symptom, although, when there is obstruction or the disease exists in individuals in the later decades of life, the acidity may be normal or below normal. Hypersecretion, giving rise to sour belching and eructations of acid fluids, is a prominent feature and one that is more persistent than hyperacidity. Hemorrhage, both obvious and occult, is less important in the diagnosis than we were led to believe,

and so far as hæmatemesis is concerned, it can only be accepted as indicative of chronic ulcer when it is preceded and followed by other symptoms of ulcer.

The most important diagnostic sign is food retention, not necessarily the gross obstruction, but the finer degrees of obstruction, causing small particles of food to be found in the stomach eight, ten, and twelve hours after meals. Other things being equal, food retention is an indication for surgical interference.

The patient with ulcer of the body of the stomach often gives a confused history—pain, coming on within an hour after eating and often passing to the left in the region of the body of the pancreas. When the symptoms are clear but not orderly in arrangement, the location of the ulcer will often be responsible for the disorderly symptoms.

A differential diagnosis between duodenal and gastric ulcer can usually be made without difficulty but it is not essential. It has been generally observed that the location of the lesion is usually duodenal if there is a long interval between food and pain, and especially if the point of pain is a little to the right of the median line as well as in the epigastrium. A very common source of error in differential diagnosis lies in the frequent association of ulcer with gall-stones, appendicitis, etc. We have frequently been able to establish these three independent conditions before operation.

Every operation upon the stomach should be preceded by a careful examination of all the organs which might harbor diseases having similar symptomatology; a differential surgical diagnosis at the time of operation is quite as essential as a differential medical diagnosis before operation.

The indications for the surgical relief of chronic ulcers of the stomach and duodenum are both positive and relative: positive if obstruction, repeated hemorrhages, and severe pain exist, or, if on account of disturbed digestion, the patient is insufficiently nourished; relative, when for any or all of these reasons the patient is unable to maintain good physical con-

dition on the food which circumstances permit him to obtain, and his chronic disability interferes with his vocation.

A study of the end results in this series of cases has been made for the purpose of showing what surgery has actually accomplished in this field. We have made a classification as follows:

First, gastric ulcers: (*a*) ulcers with obstruction, pyloric or hour-glass; (*b*) ulcers without obstruction, usually ulcers of the body of the stomach.

Second, ulcers of the duodenum treated by (*a*) gastrojejunostomy with or without infolding the ulcer; (*b*) ulcers excised with or without pyloroplasty or the gastroduodenostomy of Finney.

The operative mortality in our series of 1000, including all classes of cases and types of operation, was 2.4 per cent.; 379 of these patients were operated upon previous to June 1, 1906, before the operative technic had been well worked out, therefore imperfections in methods were responsible for some failures to cure and some deaths. However, it may be stated in a general way that in all the earlier cases in which there was obstruction, the results were favorable. Fortunately, but few cases were operated upon during the early period unless obstruction was a marked symptom; the average percentage of recoveries was therefore high. The proposition still holds good, that ulcers which cause obstruction, either potential or actual, present a high percentage of cures.

In 19 cases of duodenal ulcer, the ulcers were excised with or without pyloroplasty or the gastroduodenostomy of Finney. The cases in which excision, with or without pyloroplasty, was done were not so satisfactory as those treated by gastrojejunostomy, and two out of this small group of cases required secondary gastrojejunostomy before a cure was accomplished. The explanation of this appears to lie in the fact that after plastic operations about the pylorus crippling adhesions are prone to follow, and, while an adequate opening

can be made, the progress of food is apt to be delayed and painful. The gastroduodenostomy of Finney gave much better results than those following pyloroplasty. In fact the late results in all the cases in which we have employed the Finney operation were excellent.

In studying the histories of the gastric ulcers, we found that practically all which were situated close to the pylorus and accompanied by obstruction were relieved by gastrojejunostomy whether or not the ulcer was excised. However, whenever it was possible to do so, we excised the ulcer because of the liability to cancerous degeneration. For obstruction of the pyloric end of the stomach, and for ulcers of the duodenum, gastrojejunostomy appears to furnish practically an equal percentage of cures.

Gastrogastrostomy and gastrojejunostomy as a method of treatment for obstruction due to hour-glass stomach have given good results. With the view that the scar tissue found in the hour-glass stomach was a cancer menace, whenever possible we have made a transverse resection of the hour-glass contraction, including the scar tissue, with circular end-to-end union. While the results have been satisfactory, I believe that, taken all in all, these patients do not experience the complete relief which occurs when gastrojejunostomy is a part of the procedure.

Ulcers of the body of the stomach without obstruction, especially those deep excavations adherent to the pancreas, etc., have given the least satisfactory results following excision. In some of these cases the symptoms redeveloped to a greater or less degree, and a secondary gastrojejunostomy was necessary for relief. A *combination of gastrojejunostomy and excision* gave much better results than excision alone. It is notable that, following excision, there was more or less failure to cure when there was ample lumen in the stomach distal to the part excised, and even with excision and gastrojejunostomy the results have not equalled those obtained in pyloric stenosis and duodenal ulcers. When we explored later to

learn why these patients had not recovered, as a rule we found the site of the former operation fixed by adhesions. This has been particularly true following excision of ulcers in the posterior wall of the stomach when adhesions to the pancreas were found at the time of the primary operation.

In some cases when a gastric ulcer was difficult of access and not large, instead of excising, we have applied sutures in such a manner as to cut out the ulcer base, and have then covered the part with a second row of musculoperitoneal sutures. This procedure is simpler than excision, but it is applicable only to those ulcers having but a moderate amount of induration and in which excision would be difficult and dangerous.

In experimental studies which Maury made in the normal dog, it was shown that a pentagonal compression stitch can be applied to any hollow viscus in such manner as to destroy the included part with certainty.

In a few of the cases very extensive ulceration of the body of the stomach precluded the employment of any operation upon the stomach, and jejunostomy for jejunal feeding with complete rest of the stomach for some weeks has been necessary. Clairmont has advocated this plan strongly in such cases, and in the few instances we have practised it the results were good.

From the above data it is very evident that operations for duodenal ulcers present a higher average of cures than operations for gastric ulcers. Gastrojejunostomy, with or without infolding the ulcer, not only affords great relief to the patient with duodenal ulcer but a permanent cure in a remarkably high percentage of cases.

These statistics indicate: First, that the treatment of all duodenal and all obstructing ulcers of the pyloric end of the stomach by gastrojejunostomy and excision, or infolding the ulcer, is satisfactory and gives 98 per cent. of cures or great improvement. Second, 85 per cent. of ulcers of the body of the stomach will either be cured or greatly relieved

by excision, or devitalizing suture compression with gastro-jejunostomy. In addition, closure of the pylorus may be practised with benefit. The remaining 15 per cent. will be more or less benefited and, so far as we have observed, none have been made worse by operation. The mortality of the surgical treatment of chronic gastric and duodenal ulcer is well under 2 per cent.

NOTE.—I am indebted to Dr. Eusterman for his careful compilation of the statistics, and for ascertaining the present condition of the patients.

OBSTRUCTION OF THE ILEUM BY A LARGE GALL-STONE; ENTEROSTOMY; SUBSEQUENT CHOLECYSTECTOMY AND SUTURE OF DUODENUM.*

BY FREDERICK BATES LUND, M.D.,
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THE following case is reported on account of the interest the surgical problem presented, namely, the obstruction of the lower ileum by a large gall-stone which had reached the intestine by an anastomosis between the gall-bladder and the duodenum, and the fact that at the time of the operation another large gall-stone was felt in the gall-bladder. The patient seemed too ill to make it safe to prolong the operation for the removal of these stones in the gall-bladder and we waited three weeks, fearing all the time that this second large stone might slip into the intestine and cause a recurrence of the obstructive symptoms. At the end of the three weeks the gall-bladder was successfully separated from the duodenum and removed, and the large opening in the duodenum closed by transverse sutures. She made an uninterrupted recovery.

The patient, Mrs. L., a thin, delicate woman, aged forty-five years, had suffered four years ago from an attack of abdominal pain and vomiting without jaundice. The illness was severe enough to keep her in bed for two months. Previous to this, she had suffered from indefinite pains in her right side and more or less bloating when tired. Ever since the attack four years ago she had remained rather thin and weak. Again, two years ago, she had an attack of pain in the right hypochondrium which would begin under the right ribs and work across the abdomen, with much gas and pressure. She was so tender that she could not bear to be touched. Constipation was very severe. We had, therefore, the history of two severe attacks of pain upon which the diagnosis of gall-stones might very well

* Read before the American Surgical Association, June 21, 1911.

be made. At the time I saw her, in consultation with Drs. Dewis and Cunningham, she had been attacked, while visiting a friend, with pain in the right upper quadrant. The pain was not so severe that she felt obliged to go home, although she did not eat anything all day. Toward evening, her husband took her home, the pain then being very severe. She vomited that night and all the next day. The pain became worse and gradually moved from the right to the left side of the abdomen. She was unable to have a movement of the bowels with an enema. The third day she vomited less, and the day I saw her, which was the fourth day, about six in the evening, she had not vomited at all, but was nauseated and had had no movement of the bowels.

Examination showed a very frail, delicate woman, rather anæmic, abdominal walls thin, abdomen markedly distended, and distinct visible peristalsis. In the right iliac region a very tense coil could be felt. There was very little tenderness over the abdomen and no muscular spasm. I saw her at 6 P.M., when she was removed to the Bay State Hospital, and I operated that same evening. Rectal examination showed a rectum ballooned and empty. The tongue was dry, and she looked quite ill. The diagnosis was intestinal obstruction probably by a band, although the gradual onset of the pain did not seem exactly consistent with this diagnosis. It seems to me that a careful study of the previous history combined with the gradual onset of the pain might have suggested intestinal obstruction by a gallstone. A very interesting part of the history to me was that the pain began in the upper right quadrant and then went across to the left, probably as this large stone travelled across the duodenum and through the upper coils of the ileum in the left side of the abdominal cavity. At the operation, which was performed at 8 P.M. the fourth day, I found the upper three-fourths of the small intestine very much dilated and reddened. There was a large amount of free fluid in the peritoneal cavity. In the lower quarter of the small intestine there was a very large stone entirely blocking the bowel, which below the stone was much contracted and ribbon-like. The stone was firmly grasped by the intestinal muscle, and could with difficulty be pushed back. The intestine was incised and the stone removed. All the small intestine above the stone was then strung on a three-foot-long Monks's tube and thus easily emptied of its contents. There was

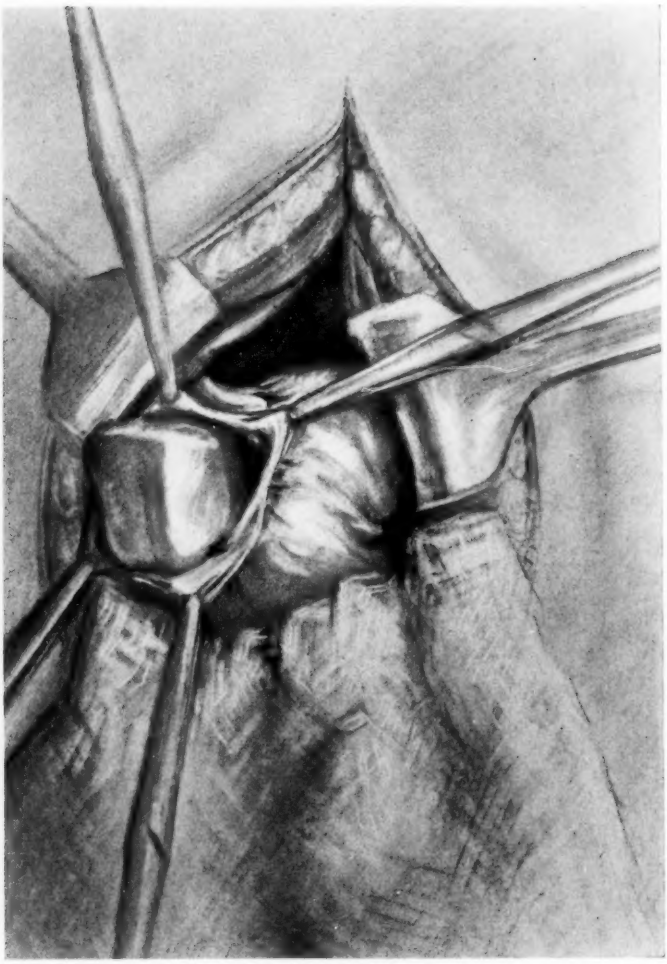
FIG. 1.

Stone removed from intestine. Photograph by Dr. Dewis. Natural size.

FIG. 2

Stones removed with gall-bladder at second operation. Photograph by Dr. Dewis. Natural size.

FIG. 3.



Showing removal of stones from gall-bladder in anastomosis with duodenum.

FIG. 4.

Duodenum sutured; stump of gall-bladder tied.

then ecchymosis on the intestine. Part of it was very dark in color. The incision in the intestine was closed with double Lembert sutures. The gall-bladder was examined and found to be in anastomosis with the duodenum. The gall-bladder was felt to contain a large stone and one or two others. Although it was felt that these stones might drop into the duodenum at any time, progress into the ileum, and cause obstruction, it was decided best to take the chances on account of the patient's poor condition, and not attempt to remove it at present. It was felt that the gall-bladder had so relaxed by the expulsion of this first large stone that probably it would not contract sufficiently to expel the other into the duodenum. The patient did well except for a stitch abscess in the abdominal wound. During the next three weeks there was tenderness over the gall-bladder and muscular spasm. She suffered somewhat from pain.

On March 28 an upper right rectus incision was made and the gall-bladder found buried in adhesions. On dissecting it out it was found to contain two stones, one of them quite large, about half the size of the one removed at the previous operation. On opening the gall-bladder, the larger stone was found to lie against a very large hole leading into the duodenum, which would easily take two of my fingers. There was no bile in the gall-bladder, which was firmly contracted about these two large stones. With considerable difficulty it was dissected free from the duodenum and removed. The adhesions, both old and new, made this a difficult proceeding, especially on the under side. The opening in the duodenum was then sutured transversely with continuous Connell sutures of catgut reinforced by interrupted Lembert linen sutures. The patient bore the proceeding well and has made an excellent recovery, and is now in good condition.

The very large size of these gall-stones is interesting. They must have remained there a long time, it seems to me, before they caused any symptoms at all.

The perforation of the gall-bladder into the duodenum, I think, must have occurred during the second attack, in 1909, as the account of this illness reads like a severe attack of local peritonitis. This large stone probably had lain against that opening ever since, which had been gradually enlarged as the contraction of the gall-bladder forced the stone against it until,

four days before I saw her, it was squeezed through and went on its way to obstruction.

The chief interest in this case, it seems to me, lies in the question of diagnosis. The commonest cause of obstruction with which we have to deal is obstruction by bands. These bands usually occur in the pelvis, either from disease of the female pelvic organs or from appendicitis, and involve the small intestine, causing strangulation and kinks. Peritonitis, due to gall-bladder disease, rarely causes intestinal obstruction because the gall-bladder is hidden behind the large intestine, between it and the liver, and can with difficulty become tied to the mobile small intestine. Therefore, intestinal obstruction by bands ought to be, and is, rare after a definite history of disease of the gall-bladder. It is also true that the onset of intestinal obstruction by bands is more acute and the progress of the disease more rapid than in the case of obstruction by an enterolith. In the case here reported, the pain at onset was not severe enough to keep the patient from continuing at her work of sewing for eight or ten hours. The gradual change of location of the pain was suggestive of the change of position of the enterolith, and the time when the symptoms became severe enough to lead to a surgeon being called was four days later. It would therefore seem possible in another case of this sort to make a correct diagnosis of obstruction by enterolith instead of the erroneous diagnosis of obstruction by a band, based (*a*) on the previous history of gall-bladder disease suggesting enterolith; (*b*) on the gradual, instead of sudden, onset and slow progress of the symptoms.

ON CHRONIC COLITIS AND PERICOLITIS.*

BY ARPAD G. GERSTER, M.D.,
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BACTERIAL infection of the peritoneum, either by direct surface contact, or from within the visceral lumina by exosmosis through their walls, leads to denudation of its endothelial covering, which may result in adhesion of adjacent surfaces. The solidity and density of adhesion seem to depend as much upon the duration as upon the intensity of the infective process. Chronic ulceration, such as for instance that caused by a foreign body in the appendix, may produce the densest and most massive deposit of newly formed connective tissue. Naturally, the deposit is most dense in the immediate vicinity of the inflammatory focus, diminishing in proportion to distance. In the case of adhesions due to bacterial infection, the principle "*cessante causa, cessat effectus*" obtains in the most eminent way. Experience on the operating table and in the autopsy room has furnished abundant proof of the truth of this fact; for, extensive, dense adhesions, which had been demonstrated at a previous operation, were found entirely absent at a subsequent operation or autopsy.

The modus of absorption and disappearance of adhesions is, strictly speaking, a physiological process, parallel to the embryonic processes of the formation of all saccular cavities lined with endothelium, such as the joints, the bursæ, the sheaths of the tendons, the pericardium, pleura, and peritoneum. Its factors are absorption, dehiscence, and locomotion, this last factor mainly derived from the friction of adjacent tissue planes.

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* Read before the American Surgical Association, June 21, 1911.

The form of adhesions observed in certain cases of chronic enterocolitis is so different from that just described, that in their case the use of the unqualified term "adhesions" is unfortunate, because misleading. While true adhesions involve at least the serosa, which is then replaced by more or less organized connective tissue, which often extends to the muscularis and mucosa, thereby causing absolute fixation of the adjacent segments, these other so-called adhesions do not enter into a close organic union even with the serous coating of the gut. They can be stripped off without difficulty, and, after their removal, the intact and glistening serous coat of the intestine is exposed. True, they do adhere, but in a very loose manner.

While dense adhesions may form between any two or more parts of the peritoneum, usually in close proximity to a destructive lesion, these veil- or cobweb-like formations have a typical site. They are invariably found on the lateral aspect of the cæcum, of the ascending and descending colon, or of the sigmoid flexure, beginning in the parietal peritoneum and radiating inward over the anterior aspect of the gut. The term "radiating" is peculiarly expressive, because their general arrangement is fan-shaped. Their attachment to the parietal peritoneum evidently represents the oldest part of the growth. This is attested by the presence of a narrow, glistening, fibrous band of tissue, which runs parallel with the longitudinal axis of the gut, and assumes a scalloped outline whenever the gut is pulled inward. The scalloping is produced by the fact that certain portions of the membrane are shorter than others, so that traction upon these shortened fibres accentuates this unevenness. We also find these shortened strands are thicker and more massive than the rest of the membrane, and further, when the gut is distended by gas, they cause visible tranverse indentations of lesser or greater depth, which often produce considerable narrowing of the intestinal lumen. Their substance is a glossy, transparent, myxoma-like, almost colorless tissue, within which, from the base to the periphery, a well-defined system of ramifying

minute vessels is seen extending transversely to the gut. This vascular system holds no close relation with that of the surface of the gut, for stripping off causes little if any hemorrhage. Should a portion of the membrane, but especially one containing a restricting band, be divided, a lozenge-shaped hiatus is immediately formed, and the correspondingly restricted area of the gut, being freed, unfolds. Transverse division of the entire "veil" consequently permits complete unfolding of the gut. Whether divided or excised, these membranes invariably reform if their cause, the colitis, persists. Their most massive development takes place around the physiological points of relative narrowing of the gut (such as the cæcum, the hepatic, sigmoid, and especially the splenic flexures). Habitual constipation arrests the progress of the intestinal contents, and should ulcerative processes supervene at these points, the membranous formation may become modified by more or less massive deposits of cicatricial tissue, representing close, true adhesions.

As attested by all authors beginning with Virchow, this process has a predilection for the vicinity of the splenic flexure, where, as Cannon has demonstrated in the cat and Holzknecht and Bloch in the human being, several factors combine to cause an arrest of fecal transportation. First of all, the large gut is firmly attached here to the under surface of the diaphragm by the short phrenocolic ligament. This, the highest attachment of the colon, is the apex of a sharp bend, where portions of the transverse and descending colon for a distance of even six inches are normally found lying parallel in close contact with each other. At the bend itself a spur is invariably present. Its action as a valve depends upon the degree of its development which is variable (Roith). According to Cannon, the purpose of this arrangement is to prevent the rapid entrance of fecal matter from the upper portions of the colon into the sigmoid. The function of the former is absorptive, of the latter, eliminative. Hence we find that ordinarily the cæcum, ascending and transverse colon are distended with fæces and gas, while the sigmoid is

empty and contracted.[1] A similar, though less pronounced arrangement exists at the hepatic flexure (Glenard). The resistance offered by the splenic flexure on one side and by the closure of the ileocæcal valve on the other, renders consecutive peristaltic and anti-peristaltic locomotion of intestinal contents between these points possible. If through certain influences, this normal or quasinormal retardation becomes exaggerated, undue desiccation will take place above the splenic flexure, and with this, at first occasional, later on frequent, and finally, habitual constipation follows. With a preponderant meat diet, the nature of the bacterial flora of the cæcum and colon are modified;[2] putrefactive processes then engender catarrhal changes in the mucosa, leading both to the penetration of the intestinal tissue by pathogenic microorganisms, and to the absorption into the circulation of their products as well as those resulting from decomposition of food remnants and secretions.

This sequence of events is attested by the fact that in persons suffering from habitual constipation, over-copious meals containing much meat are followed by attacks of severe colic, mainly located in the region of the cæcum, relieved by abundant stools containing both old solid and recently formed fecal matter. Very often these attacks of colic have a most alarming character, consequently they are apt to lead to erroneous diagnoses and ill-advised operations. The chief location of the pain and of the resistance to touch simulating a solid tumor is in the cæcal region. Under such circumstances a diagnosis of acute appendicitis has often been made, and operation has revealed a perfectly normal appendix and a greatly distended colon. Here, after operation, attacks have continued to recur as before. In other instances, where the appendix was found to be really diseased, its removal nevertheless did not free the patient from recurrent and violent attacks of cæcal disorder. The explanation of this is, that the appendicitis was the secondary, though most pronounced and urgent part of the process, while its fundamental element was the colitis. The marked symptoms of the complicating appendicitis over-

shadowed the underlying colitis, which consequently escaped attention. Hence it is not rare that the successful removal of a damaged appendix is not followed by complete and lasting cure; and more or less prolonged periods of temporary relief can only be obtained by means of careful and continuous regulation of the intestinal function by diet, enemata, and laxatives.

The symptomatic pre-eminence of the cæcum and ascending colon is based on certain anatomical peculiarities of this part of the large intestine. First, it normally represents the widest and most distensible portion. This distensibility is the direct outcome of the fact that here the muscular layer is thinner and weaker than in any other part of the large intestine. Furthermore, being the chief seat of bacterial proliferation, it is also the chief seat of catarrhal disturbances and of gaseous production. The final outcome of these factors is habitual distention and atony ("typhlatony").

Wilms[3] found in a considerable number of cases, that symptoms of chronic appendicitis were simulated by cæcal processes, which, in his opinion, were due to great laxity of the attachments of the caput coli. To this abnormal mobility he attributed an impeding effect upon cæcal evacuation, which in its turn was responsible for recurrent attacks of cæcal colic. This symptom complex consisted in the periodic appearance of a palpable, painful tumor in the right iliac fossa, with simultaneous recurrence, in the habitually constipated patients, of violent attacks of colic centred about the cæcum, the trouble being relieved by one or more copious evacuations of fæces and gas.

Note 1.—In a recent communication of great interest (Schmerzempfindungen innerhalb der Bauchhöhle, etc., *Med. Klin.*, Jan., 1911) dealing with the significance of pain in the abdominal cavity, Wilms refers to the regular presence of pseudoperitoneal veil-like "adhesions" about the cæcum mobile, characterizing pains from these as "Adnäsions beschwerden." This is, however, only a seeming paradox.

The correctness of Wilms's views seems to be supported by the evidence of his experience with colopexy done by him

for so-called cæcum mobile in 43 cases.[4] Of these, 75 per cent. were cured, 16 per cent. improved, and 9 per cent. remained unimproved.

That the element of excessive mobility alone is not adequate to explain the symptoms of Wilms's so-called cæcum mobile, seems to be admitted by the reasonings contained in an excellent article on the same subject by his assistant Stierlin,[5] who concedes, that mobility of the cæcum was observed in from 10 to 23 per cent. of a series of cadavers, in which all evidence of intestinal trouble was lacking. A number of years ago both Wandel and Curschman called attention to the frequency of a long attachment of the cæcum, a condition that in itself is symptomless and may be accidentally found at autopsy.

Habitual constipation is an indispensable factor, a factor which will determine attacks similar to, if not identical with, those of Wilms's cæcum mobile syndrome; and this, in cases (my own observation) where the attachments of the cæcum were not only not too long, but where the cæcum was actually bound down by true adhesions. It may be readily admitted that undue mobility, by facilitating distention through lack of support, and by exaggerating the effect of compression by bands, can increase resistance to the expulsive efforts of the cæcum. The presence of these factors aggravates the pain of colic here.

The question of the first cause of the trouble is still undecided. A congenital redundancy of the large gut is undoubtedly a predisposing element, but it seems that in the majority of cases the resultants of an improper way of living constitute the evident cause. These comprise not only habitual errors of physical hygiene,—of which those of diet hold the foremost rank,—but also faults of mental and moral régime, the emotions, through the glandular secretions, having a most important influence upon the processes of digestion, absorption, and assimilation.

The well-known vicious circle of enteroptosis, chronic colitis, autointoxication, and neurasthenia need not be dwelt

upon here. It may suffice to say that in many cases where there is no hereditary taint, an acquired neurasthenia of intestinal origin may be improved, if not cured, by proper measures.

Though the common forms of chronic colitis in most instances lead only to the formation of the pannus-like pericolitic membranes above described, in rare instances they may cause the development of intramural abscess of the intestinal wall, with or without perforation. Bittorf[6] quotes Lejars (*Sem. Med.*, 1907, No. 52) and Donaldson (*Brit. Med. Jour.*, 1907), who have encountered perisigmoidal abscesses on the operating table. He also mentions similar experiences of himself (*loc. cit.*, p. 163) and of Bäumler (*Arch. f. klin. Med.*, vol. lxxiii, 1902, p. 96), one of whom found a non-perforated intramural abscess of the cæcum near the ileocolic valve, the other a similar abscess in the wall of the ascending colon. Both patients died of streptococcic peritonitis. In both of these cases the appendix was healthy. Bittorf (*loc. cit.*, p. 162) mentions besides these, the case of Matthes, who, operating for presumed appendicitis, found the appendix normal, the sigmoid, however, intensely congested and thickly coated with a deposit of fibrin.

The peculiar parallelism of transverse and descending colon, near the splenic flexure, and the sharp angle and spur formation there, constitute favorable conditions for producing and maintaining constipation. The resulting chronic colitis may lead to production of copious pseudoperitoneal membranes. Where fecal retention has led to ulcerative processes of the mucosa, extensive firm adhesions between the parallel segments of the intestine may result.* This condition is so typical that the term "Doppelflintenstenose"—double barrel stenosis—has been suggested and accepted.

Various examples of the disorder are cited in American.†

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* Analogous conditions have been observed at the hepatic flexure.

† The most noteworthy American publication on this subject to date (May, 1911) is by Jabez N. Jackson, "Membranous Pericolitis," Surgery, Gynæcology, and Obstetrics, Sept., 1909, p. 278.

French, and German literature. Cases of Tixier, Terrier, Poirier, Legueu, Bérard, Quénu, Walther, Routier, and Bergmann are quoted in abstract by Braun.[7] More recently both Payr[8] and Allard[9] have observed ulcerative changes and a complicated system of adhesions with stenosis at the splenic flexure, and marked, often enormous distention of the transverse and ascending, and an empty and shrunken state of the descending colon. A certain number of the patients were relieved by colo-colostomy, ileosigmoidostomy, or by the establishment of an artificial anus.

NOTE 2.—All the surgical measures, beginning from colopexy (Wilms), extending to colocolostomy, colosigmoidostomy, and culminating in Lane's heroic abolition of the entire large gut, are mere mechanical makeshifts applied to correct the mechanical factor of the later and latest phases of long-neglected processes, which might have once been prevented by a timely dietary règimen and the simplest medication. In verity, our triumphs in connecting and disconnecting tubes and receptacles are but a sort of glorified plumbing.

CONCLUSIONS

1. The peritoneum reacts to the infectious processes ordinarily associated with chronic colitis, by the formation of characteristic vascularized transparent membranes (pseudoperitoneum), which take their origin along the external lateral aspects of the cæcum, ascending colon, and hepatic flexure on one side, and the sigmoid flexure, descending colon, and splenic flexure on the other.

In a general way, this line of origin runs parallel with the long axis of the gut, and the tissues deposited along this line represent the oldest constituents of the membrane. The membrane extends transversely across the gut, and, often reaching to the inner reflection of the peritoneum, completely envelops the intestines in a system of fan-like, radiating bands, between which the thinner parts of the membrane are outstretched like webs. Except at the flexures, constriction by one or more thickened bands of membrane is rarely marked enough to provoke ileus-like symptoms. However, flexion of a lax, unduly dilated, and abnormally movable portion of

the gut upon the edge of such a strand may occasionally cause serious trouble.

2. An eminently predisposing factor of chronic colitis is an undue developmental accentuation of the physiological apparatus serving to retard fecal transportation. This refers mainly to the arrangement of the splenic, and, in a lesser degree, of the hepatic and sigmoid flexures. Congenital or acquired laxity of attachment, and congenital or acquired redundancy of diameter, or of length, of certain portions of the large intestine, may both be strongly predisposing and seriously aggravating factors in the development and course of the disease.

3. Prevention has a wide field of usefulness, especially here in America, where chronic colitis is almost endemic. A reasonable restriction of animal food will control putrefactive processes; a generous and daily use of fresh vegetable matter in the shape of well-cooked and attractively seasoned dishes will supply bulk and friction needed to induce normal and adequate peristalsis. The practice of what may be called "physiological intestinal discipline" should be inculcated from infancy, and should become as much a part of personal hygiene as are ablutions and baths.

NOTE 3.—The prolonged use of daily small doses (1 teaspoonful) of castor oil, taken before breakfast, combined with a diet suitably adapted to each case will cure, or at least control, many cases of early and not too aggravated chronic colitis. Buttermilk is an admirable adjuvant.

4. The graver aspects of the malady usually demand surgical intervention; but here, too, good results follow only, if dietary and general hygienic measures are subsequently instituted and consistently practised.

HISTORIES

To illustrate the condition, I present herewith extracts from the histories of five typical cases observed in my wards between November 10, 1910, and April 12, 1911.

CASE I (Surg. No. 118784).—Joseph W., aged thirty-five; tailor; Russian. Admitted Nov. 10, 1910.

He had been more or less constipated since early boyhood; for the past 18 months, attacks of obstinate constipation had become more and more severe; these attacks ended in severe general colicky pain, which became most marked in the ileocæcal region. During each one of these attacks a painful and hard tumor was observed in the iliac fossa; this softened after cessation of the paroxysm but did not disappear. The paroxysms continued at short intervals until copious evacuations of hard, then soft fæces ended the attack. A mucoid, slightly bloody diarrhœa (10 to 15 stools per day) followed for three or four days, gradually diminishing until constipation again set in. Considerable loss of flesh and strength.

Status Præsens.—A fairly nourished, somewhat anæmic man. Lungs, heart, and large glands of the body were normal. The abdomen was soft and flat, except in the right iliac fossa, where a tympanitic, tender, soft tumor was felt, which became rigid and painful under repeated palpation. The pain was colicky and ended coincidently with the termination of erectile effort of the mass which evidently consisted of the cæcum and the lower portion of the ascending colon. The tumor was laterally movable to a moderate extent, and presented a roughly cylindrical outline which however varied both in size and contour during the different fits of pain. Under all circumstances, a hard, cord-like projection could be felt extending downward from the lower pole; this, unlike the rest of the mass, remained sensitive to pressure during the intervals of intestinal repose. There were moderate elevations of temperature. Urinary findings were negative.

Diagnosis.—Chronic colitis, with chronic stenosis of hepatic flexure; possible inflammatory tumor of ileocæcal region, or chronic appendicitis. A neoplasm was excluded.

November 15: Laparotomy through right rectus; the incision was made four inches long, to permit of an adequate examination. The cæcum and ascending colon were much dilated by gas and fæces, their walls were somewhat congested and thickened. A thick, solid band was seen extending from the parietes downward and inward to the hepatic flexure, crossing it, and forming a pronounced point of obstruction (Fig. 1). Considerable manual pressure was needed to propel gas past this point. The thickest

portion of this membrane was divided by a transverse incision, whereupon the gases in the cæcum immediately escaped into the transverse colon. The site of the incision assumed the shape of a lozenge, the longer sides of which (lying crosswise to the longitudinal axis of the gut) were united by a few catgut stitches. A similar membrane of lesser size, involving the ascending colon, was likewise dealt with. The caput coli and appendix were thickly enveloped in an extensive arrangement of pseudomembrane from which, the thickened and congested appendix, which was bent upon itself, was easily shelled out,

FIG. 1.*

Showing pseudomembranous fibres and bands resulting from chronic colitis (Case I).

ligated, and amputated. This evidently was the hard body felt before operation at the lower end of the mass. The membrane around the cæcum was transversely divided and longitudinally sutured, as done before at the hepatic flexure. Layer suture of abdominal wound. Uneventful recovery. Discharged Nov. 27.

In May, 1911, the patient presented himself once more, complaining of recurrent mild attacks of pain in the right iliac fossa. He had gained flesh but was becoming constipated again. In the absence of the "air-cushion symptom" and of erectile spasms, he was dissuaded from operation which he desired. He was

*All the diagrams were made by the author in the operating room, directly after the operations.

further advised to resume the dietary régime previously followed, which he had lately neglected to observe.

Epicrisis.—Though the local and most conspicuous symptoms disappeared for awhile, the chronic colitis remained uncured and required attention. The appendicitis here was undoubtedly secondary to the long-standing colitis. It would be absurd to expect that removal of a diseased appendix could cure a colitis; yet this was and still is taught by a number of surgeons.

CASE II (Surg. No. 119425).—Hyman T., aged thirty; clerk; Austrian. Admitted December 12, 1910.

Bowels constipated for several years past; chronic cough for four months; no hæmoptysis, expectoration, or night-sweats. No loss of weight. Five months ago he had an attack of violent abdominal pain (his first), lasting two days and relieved by catharsis. Since three weeks repeated attacks of similar character set in, the first one relieved by a laxative, the later ones recurring although the bowels were kept open. No blood in stools, no urinary symptoms.

Status Præsens.—General condition excellent. Physical examination revealed no abnormalities, except in the abdomen, where a tumor of the right iliac fossa was visible. This was movable, soft, and tympanitic. Prolonged palpation caused striking signs of intestinal erection with moderate colicky pain. Between spasms, slight pain on palpation was present all over the cæcum. No fever.

Diagnosis.—Chronic colitis; chronic stenosis of hepatic flexure. The question of appendicitis was left open, since no definite appendicular signs were present.

December 15: Laparotomy, Kammerer's incision four inches long. The ascending colon was found distended and bound to the parietes by two systems of pseudoperitoneal membrane; an upper aggregation, consisting of two bundles, which were rather massive and firm, constricted the hepatic flexure. Lower down, another fan-like membrane compressed the middle portion of the ascending colon, causing a deep indentation there. Below the caput coli, a stout, glistening mass ascended from the pelvic parietes and bifurcated about an inch from the cæcum (Fig. 2). Its mesial branch spread over the tænia coli, and its lateral one extended over the external portion of the cæcum. Between

these two bands was an open falciform pocket into which the finger could be introduced for an inch and a half. Slight pressure caused the sudden protrusion of the apex and distal two inches of a normal looking appendix. The base of the appendix was covered by membranous material which was easily wiped off. All the bands just described were divided wherever they diminished the lumen of the gut. Those around the appendix were removed together with that organ, which was absolutely sound. The wound was closed completely. Uneventful recovery. Cessation of all colicky symptoms. Discharged January 1, 1911.

FIG. 2.

Membranous bands present in Case II.

Epicrisis.—Though the duration of the disorder was not as long as that of the previous case, the anatomical changes and symptoms were of a pronounced character. The lesser intensity of pain might be explained by the absence of congestion of the cæcum and ascending colon. The lack of marked inflammatory changes here was assumed to indicate a colitis of rather benign type. The absence of fever and the good condition of the patient confirmed this view. And yet, with a mild colitis, there was a prodigious development of pseudoperitoneal membrane, the expression of an advancing proliferation, a process which had begun to cause stenosis and intestinal erection and which must be ascribed to irritation from materials absorbed

from the interior of the intestine. These facts suggest that the peritoneum reacts in one way to concentrated toxins from an acute bacterial invasion, and in another way to the toxic substances derived from putrefying intestinal contents. Combined forms of these two processes must, of course, be very common, and hence tend to confuse matters.

CASE III (Surg. No. 119,732).—Rosa G., aged twenty; bookkeeper; born in United States. Admitted December 29, 1910.

She had been constipated for several years, and had suffered from periodical attacks of sharp bellyache, relieved by laxatives. Menses normal. Continuous dull aching pain in right flank for some time. Two days previously diffuse colicky pains set in all over the abdomen; she vomited four times. The following day the pain became excruciating and most marked in the right iliac fossa. She vomited again.

On admission temperature 102.4° F., pulse and respiration somewhat accelerated, anxious facial expression. Well nourished. Lungs, heart, and upper organs of abdomen negative; urine normal. Abdomen moderately distended; right rectus rigid, hence palpation unsatisfactory. No dulness over iliac fossa. Per rectum no mass felt, but right side of pelvis very painful to touch.

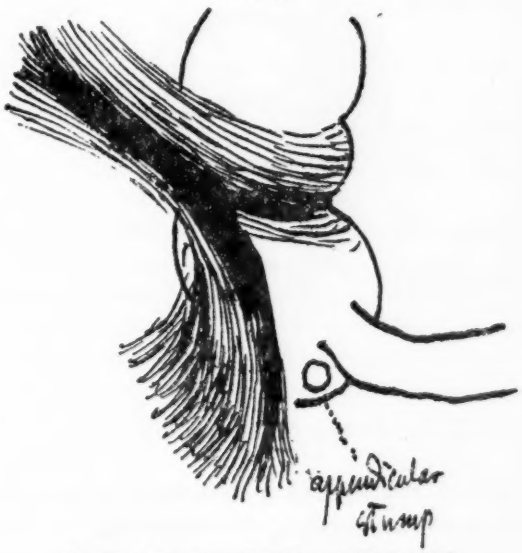
Diagnosis.—Chronic colitis of old standing. Recent appendicitis; the fever, local muscular rigidity, vomiting, together with the absence of an exudate indicating an acute form without perforation.

December 29: Laparotomy. Kammerer's incision of three inches' length. The appendix was closely bound to the cæcum by recent, firm, very vascular adhesions; blunt separation of these was difficult and caused copious oozing. Both the appendix and the adjacent parts of the cæcum were intensely congested, thickened, and brittle. In tying off the base of the appendix, the ligature cut through the outer layers. Stump of appendicular mucosa was thoroughly charred with the actual cautery, then depressed, and buried under two tiers of sutures. Examination of the appendix showed a tight stricture close to the line of section, beyond which the lumen was distended by about half a drachm of thick, odorless pus; *empyema.* The outer side of ascending colon was invested by an extensive pseudoperitoneal membrane, originating as usual along the external line of reflection. It swept in a graceful curve downward toward the cæcum,

along the outer edge of which it again became united with the parietal peritoneum (Fig. 3). A thickened, rib-like portion of this membrane suggested comparison with the rib and beard of a feathered plume. There was a noticeable constriction of the gut above the cæcum. The membrane was easily separated from the colon, tied off, and removed. Cigarette drainage to appendicular stump and layer suture of wound. The temperature immediately fell to 101.8° F., and steadily descended to the normal. Drain removed on third day; no suppuration. Discharged, healed, on January 13, 1911.

Epicrisis.—The presence of extensive and retracted membrane indicated that the colitis must have preceded the attack of acute appendicitis by some time; appendicitis masked the colitis.

FIG. 3.



Pseudoperitoneal membrane, present in Case III.

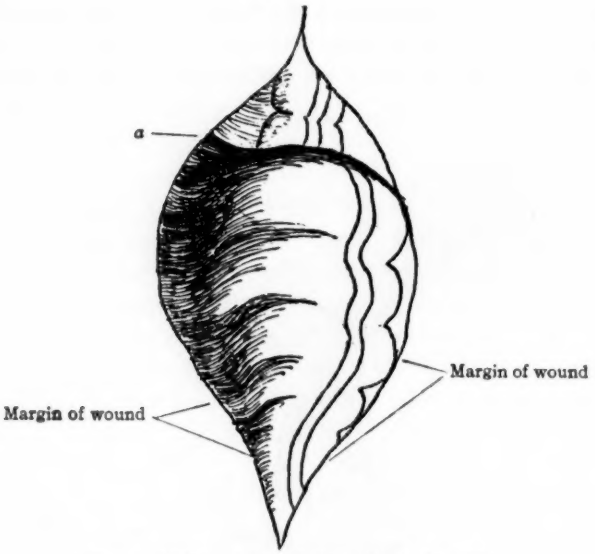
CASE IV (Surg. No. 120,661).—Sarah K., aged twelve; school girl; Russian. Admitted February 12, 1911.

Two years previously she had been operated upon for appendicitis at another hospital. She remained at that institution nine days. The colicky pains, the tenderness in the right iliac fossa, and the obstinate constipation from which she suffered disappeared for a little while after operation, that was, only as long

as she was kept on liquid and soft diet. There was occasional vomiting. Pains were worse at night, and especially bad after meals. No urinary disturbance. Menstruation had not set in.

Status Præsens.—General condition fair. Choreiform movements of head, neck, and hands. Lungs negative. Systolic cardiac murmur at apex. Abdomen slightly distended; a vertical scar of right iliac region; no hernia. In the right iliac fossa an elastic, non-movable tympanitic mass was felt. Pressure on

FIG. 4.



Dense, thick band constricting colon in Case IV.

this was painful, and elicited a succession of gurgling sounds. Pulse and temperature normal. Urine normal.

Diagnosis.—Chronic colitis with chronic stenosis of ascending colon or hepatic flexure.

February 21: Laparotomy. Excision of the entire scar; this was not adherent to the cæcum. Caput coli and about five inches of the ascending colon were closely invested by an extensive system of pale, almost translucent and scantily vascularized peritoneal pseudomembrane. A tense, balloon-shaped dilatation involving the cæcum and lower part of the ascending colon was evidently caused by a dense, thick band visible at the

upper angle of the abdominal incision (*a*, Fig. 4). This band formed the upper edge and thickest part of a membrane, such as we have previously described. The bulging distended portion below, and the shrunken and empty segment of the gut above the line of constriction presented a striking contrast. The empty gut above became visible only when the overlapping, dilated portion below was pulled aside. Complete section of the membrane, including its thickened upper margin, was carried along the outer line of reflection of the gut, and effected a complete liberation of cæcum and colon. The stump of the appendix, which had been removed at a previous operation, presented nothing unusual. Closure of abdominal wound. Uneventful, rapid recovery, with cessation of the previous symptoms, which had furnished the indication for the operation. The patient was instructed to observe a strict diet and to use castor oil in small doses for a long time. Discharged February 25.

Epicrisis.—The short convalescence after the first operation and the small scar permit the inference that the appendix could not have been the seat of a very severe inflammation. Colitis had evidently preceded the appendicitis. After all, was there any appendicitis?

Case V (Surg. No. 121,594).—Abraham H., aged thirty-six; fur-cutter; Roumanian. Admitted March 31, 1911.

Habitual and obstinate constipation of many years' standing. During the past two years there had been twelve attacks of colicky pain, principally centred in the iliac fossa. Three days before admission the present attack began with indefinite pains both in the right iliac and the left lumbar regions. There was nausea with much belching.

Status Præsens.—A violent attack of colic, lasting about an hour, occurred shortly after admission. There was nausea and sweating, but no fever. Tension of the right rectus was variable; it disappeared with cessation of colic. A tympanitic, tender, elastic swelling in the right iliac fossa emitted gurgling sounds on pressure.

Diagnosis.—Chronic colitis with stenosis of the ascending colon; a possible chronic appendicitis.

March 31: Laparotomy by the house surgeon, Dr. Greenberg, disclosed the presence of a continuous membrane extending from the right lateral parietal peritoneum across the cæcum and ascend-

ing colon. Its most massive portion involved the hepatic flexure. The pale appendix, which was not adherent, was five inches long. It was removed, and examination of its interior showed nothing abnormal. The membrane was left intact, and the abdomen was closed. Uneventful recovery. Patient was discharged April 12, with directions as to diet and régime. He was requested to report from time to time, so that the effect of simple removal of the appendix might be studied.

Epicrisis.—This was another case in which colicky attacks due to chronic stenosis might have induced a superficial observer to diagnose appendicitis, or that phantom, appendicular colic. It will be interesting to see in this case, whether the removal of a practically normal appendix will or will not cure a chronic colitis. The simple excision of an obliterating or obliterated appendix has been credited with such a marvellous efficacy in curing almost all the ills of the gastro-enteric tract *by reflex action,* that a critical revision of accepted opinions might well repay the trouble. It is held that minute changes in an appendix, many of them suggested, or rather dictated by enthusiastic surgeons to the minds of complacent and accommodating pathologists, provoke by reflex action "hyperacidity, pylorospasm, true pyloric stenosis, cardiospasm, acute and chronic colitis, and even chronic pancreatitis with jaundice, cholecystitis and cholelithiasis." The appendix, in short, has become a sort of biblical black sheep, which can conveniently be charged with as many unexplained ills of the human fabric as were formerly the uterine appendages. (The superior convenience of the appendix for this purpose is evident, since it is owned by both sexes.)

The marvellous cures of remote disorders ascribed to the removal of appendices showing chronic or obliterative changes, should be accepted on better warranty than that offered by the argument "post hoc, ergo propter hoc." Is it not possible, that the preparation for, and the régime following laparotomy is in many cases, the first serious and real regulation not only of the diet but of the entire trend of a heretofore perverse and irrational course of life; and this, notwithstanding the fact that such patients may have been surrounded for years by the solicitous care of "eminent specialists"?

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INTUSSUSCEPTION CAUSED BY A LIPOMA OF THE DESCENDING COLON.*

ACUTE INTESTINAL OBSTRUCTION; RESECTION OF THE COLON.

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INTUSSUSCEPTION, comparatively with other intra-abdominal surgical conditions, is an accident which may be regarded as rare. Benign tumors of the intestine provocative of intussusception are rarer, and acute intestinal obstruction due to intussusception caused by a lipoma is one of the rarest conditions to confront the surgeon.

A thorough review of medical literature reveals but 19 cases of acute intestinal obstruction due to this cause. Of these cases, treated variously, there are recorded only five recoveries following laparotomy. In view, therefore, not only of the rarity of this condition, which attracts more interest from the pathologico-anatomical than from the clinical standpoint, but also because of the few recoveries that have occurred after intra-abdominal intervention, it may be justifiable to report two other cases successfully operated.[1]

CASE I.—Mrs. J. C., aged thirty-three years, a patient of Dr. J. R. Crawford, was admitted to the Presbyterian Hospital, in my service, on March 13, 1908, with the following history: The patient stated that on March 9 she suffered from cramp-like pain in the lower abdomen, for which she took castor oil. This was followed by a fecal evacuation, but an increase in the abdominal pain. On March 11 she passed a stool containing blood and mucus. Vomiting also occurred on this date.

Examination upon admission demonstrated no abdominal dis-

* Read by title before the American Surgical Association, June, 1911.

[1] The second of these cases was brought to my attention by Dr. John M. T. Finney, of Baltimore, after this report had been undertaken, who has kindly permitted me to incorporate it in this article.

tention but flabby abdominal walls. The pulse and temperature were normal. An indefinite tumor mass was palpable in the left iliac fossa. Slight tenderness and rigidity were palpable on the right side of the abdomen over the appendiceal region. Rectal examination demonstrated no mass, but was followed by the discharge of a small quantity of bloody mucus. On March 14, as the case was thought to be one of intussusception, operation was advised and accepted.

Operation.—An incision four inches in length was made through the left rectus muscle and peritoneum, exposing the descending colon, exhibiting a mass about three inches above the sigmoid flexure. Upon examination this mass proved to be an intussusception of the descending colon. The intussusception was reduced by gentle manipulation, whereupon it was discovered that there was present in the colon a firm mass, which by manipulation could not be displaced upward or downward to any marked extent. The colon was then incised over the mass and a purplish-colored tumor, two and one-half inches in length by one and one-half inches in diameter, was exposed, arising apparently from the mucous membrane of the wall of the colon. The tumor was attached to the wall of the bowel by a short, broad pedicle, having its origin from more than one-half of the circumference of the intestine. Owing to the extensive surface of attachment of the tumor, it was decided that resection of the bowel was necessary to secure its complete removal. Accordingly, about two inches of the colon, including the attachment of the tumor, were excised, and the divided ends of the gut were brought together and held in apposition by a Murphy button. A gauze drain was introduced to the site of anastomosis and the wound closed by tier sutures.

The patient did well after the operation. On the thirteenth day following operation an X-ray examination showed that the button had passed into the rectum, from which it was removed. The wound closed on the fifteenth day and the patient was discharged from the hospital on May 8. Her physician reports that she has been in good condition since leaving the hospital, and is well at the present time.

Pathological Report.—Specimen is an irregularly oval mass of tissue measuring approximately 2½ by 1½ inches in its two diameters. The exterior of the tumor is covered by mucous membrane, which in places

has undergone ulceration, most marked over its free end. A longitudinal section presents the oily surfaces of fatty tissue exhibiting a lobulated configuration. The consistency is that of ordinary compact adipose tissue. (See Figs. 1 and 2, demonstrating respectively the external and internal appearances of the tumor.)

Histologically, the appearance is represented by the microscopic drawing (Fig. 3). The mucosa, muscle, and a minute portion of the adipose tissue are clearly depicted. Although no area of ulceration of the mucosa is shown in this field, two foci of extensive inflammatory cellular infiltration are conspicuous in the mucous membrane. The microscope definitely establishes the subserous nature of the tumor, inasmuch as it is separated from the mucosa by the intervening muscular coat of the intestine.

Diagnosis.—Subserous lipoma.

CASE II.—Mr. J. D. W., aged thirty-five years, admitted to the Union Protestant Infirmary January 10, 1911, was operated on, and is reported here by the courtesy of Dr. John M. T. Finney, of Baltimore.

Upon admission, patient gave an absolutely negative previous medical history. His attack began five weeks prior to admission, with the history of having been awakened at 5 A.M. by pain in the abdomen, followed by several blood-streaked stools during the next two hours. Throughout the day he had frequent attacks of pain along the left side of abdomen. The following day he could feel an indefinite mass on left side, which disappeared in a few days. One week later patient began to pass two to three tablespoonfuls of blood with each stool. The stools averaged two to three per day for about three days, with the assistance of hot enemata. Patient had a third attack a week later. Two weeks ago he was admitted to the Charlotte Hospital, and received treatment by enemata, which was followed in two or three days by the passage of yellow mucus. For the last three weeks he has had pain just above the rectum and in the back. Slight tenderness upon pressure over the left side of the abdomen. Abdominal palpation was difficult because of rigidity of the muscles. No mass was palpable. The finding of tubercle bacilli in the fecal discharges prompted the diagnosis of tuberculous ulceration of the colon.

Operation.—Upon opening the abdomen a mass about the size of a lemon was found in the descending colon just below the splenic flexure. This mass first suggested an intussusception, as a portion of the wall of the colon was invaginated with the

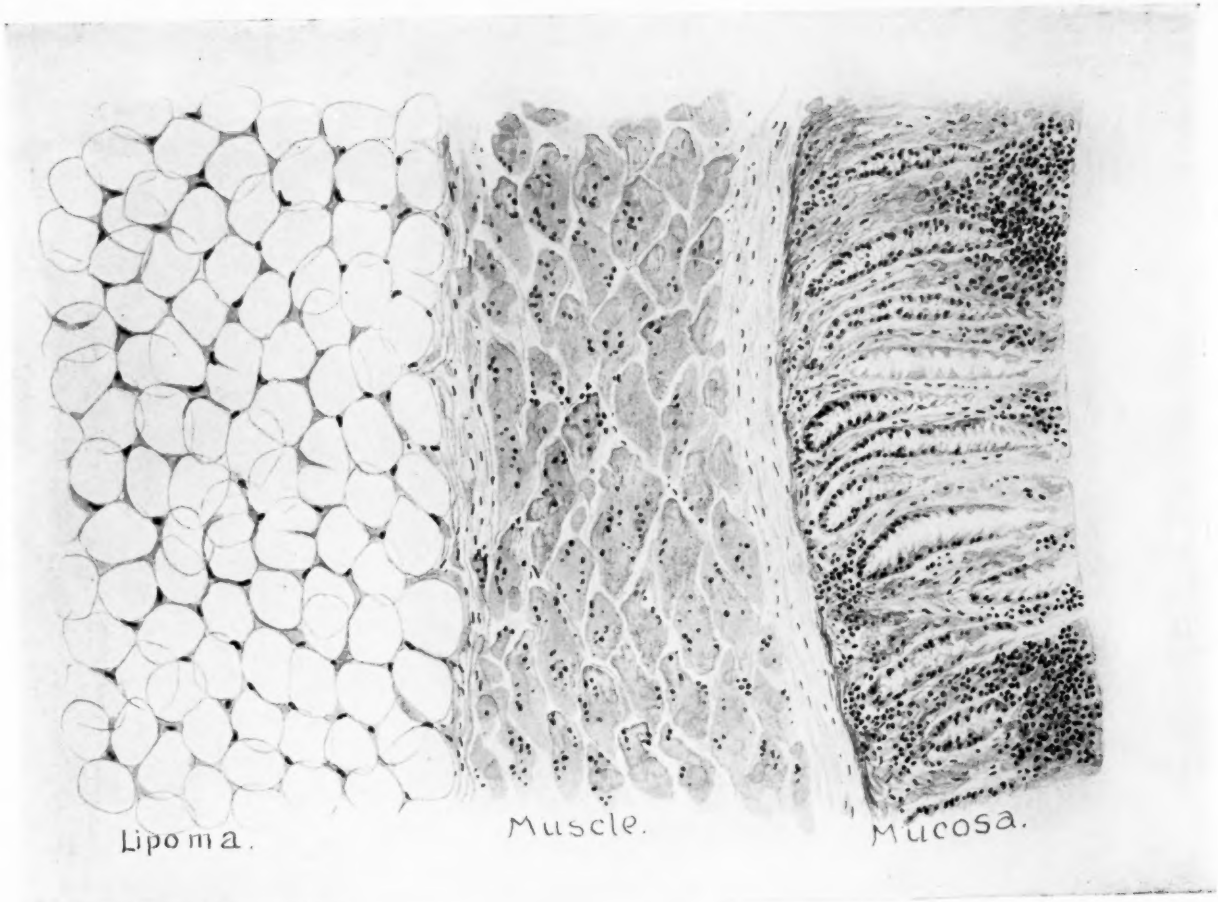
FIG. 1.

Lipoma measuring 2½ and 1½ inches in its diameters. The exterior, as will be seen, exhibits marked ulceration.

FIG. 2.

Mesial section of lipoma, the cut oily surface demonstrating characteristic lobulation.

FIG. 3.



Histological drawing from microscopical specimen. This particular field shows no ulceration of the mucosa, but extensive inflammatory reaction. The subserous nature of the tumor is demonstrated by the interposition of the muscular coat of the intestine between the tumor and the mucosa.

segment just below it. An attempt was made to relieve this invagination, but it was found impossible to do so. It was, therefore, decided to resect this portion of the colon. It was found necessary, in order to facilitate the subsequent anastomosis of the two portions of the bowel to resect practically the whole of the descending colon, together with the splenic flexure, after which it was very easy to appose the transverse colon and the sigmoid flexure. The intestine was divided with the actual cautery between two clamps and the divided ends invaginated into the lumen after the manner of the treatment of the stump of an appendix. A lateral anastomosis was then performed in the usual way.

The patient made a good recovery, with the exception of an infection in the lower angle of the abdominal wound, which necessitated the reopening of this angle and healing by granulation. He left the hospital on March 1, 1911, in excellent condition, with a healed wound.

Pathological Report.—Examination of the specimen showed a lipoma of the size of an English walnut or larger, arising from the mesenteric border of the intestine. The lipoma was somewhat pedunculated, and had gradually encroached upon the lumen of the bowel, until finally it had almost occluded it, and in the effort of the intestine to pass on the obstruction, a partial intussusception had been brought about. The surface of the lipoma was gangrenous with some ulceration, which had evidently given rise to the bloody mucous stools prior to the operation. The microscopic examination of the tumor revealed nothing but fat and fibrous tissue.

The following cases of intussusception due to lipoma have been collected after a painstaking search through literature. They number but 19, exclusive of the two included in this article, and in reviewing the individual cases, for the sake of brevity, attention has been directed merely to the notation of the reporter, with his reference, the age, sex, prior history of the patient, the character of the onset of the attack, condition of intestines, rectal and abdominal findings, operation, site and pathology of the tumor, and the result of the case.

1. MECKEL (*Handbuch der Pathol. Anat.*, Leipzig, 1816) reports a case of his father's, where a lipoma caused an intestinal invagination.

2. Virchow (*Die krankhafte Geschwülste*, 1863, Band i, p. 382) reports the case of SANGALLI, where two submucous lipomata were found in

Histological drawing from microscopic [illegible] is demonstrated by the interposition of the muscular coat of the intestine between the tumor reaction. The subserous nature of the tumor and the mucosa.

the descending colon, one being the size of a hen's egg and pedunculated, and had produced invagination and finally prolapse.

3. CASTELAIN (*Gaz. Hebd.*, 1870, No. 20) reports the case of a male, aged forty-three years, who previously was troubled with habitual constipation. Attack began with loss of appetite, nausea and constipation, and rectal tenesmus. Presence of blood and mucus at anus was followed in the fourth week by discharge of a large pedunculated tumor, which proved to be lipoma. Recovery.

4. NINAUS (*Verein d. Aenzt in Steiermark*, 1871) cites the case of a male, aged thirty-two years, with previous history of intermittent attacks of pain for months. Present attack began with acute pain, vomiting for eight days, and constipation. On the eighth day blood was observed in the rectum. Was operated on twenty-sixth day. A discharge of slough was followed by recovery. Pathologically, the intestinal segment was found to have a lipomatous polyp. Obstructive symptoms recurred a year later and he was never well afterward.

5. ALBRECHT (*Petersb. med. Wochenschrift*, 1880, No. 9) reports the case of a male, aged fifty-one years. Attack began with pain, followed by diarrhœa. Mucus and blood were found by rectal examination. During the sixth week a pedunculated lipoma was discharged from large intestine.

6. VOIS (*Norsk. Mag. f. Lagividere*, 1881) reports the case of invagination of the lipoma into rectum. The tumor was resected and the intussusception reduced by water injection.

7. MARCHAND (*Le Progrès. Méd.*, 1882, No. 11, p. 202) records the case of a female adult. Attack was recurrent after nine months. Patient had absolute constipation. Rectal examination demonstrated a tumor 8 cm. from anus. Operation consisted of sigmoidostomy. Patient died. Autopsy revealed a lipoma at apex of intussusception.

8. BROHL-TUFFIER ("Invagination de S'iliaque dans le rectum. Lipom de l'intestin," *Le Progrès Méd.*, 1882) report the case of a female, aged forty-three years, having the previous history of increasing constipation for nine months and pain for four months in left inguinal region. Rectal examination revealed a tumor. Laparotomy displayed an invagination of S. romanum into the rectum. The intussusception was irreducible, and an inguinal colostomy was performed. Patient died of peritonitis on fifth day. Postmortem examination revealed an orange-sized, pear-shaped, pedunculated submucous lipoma located in the lower part of the S. romanum.

9. CLOS (*Thèse*, Paris, 1883) reports the case of a female, aged forty-five years. Attack began very acutely with typical symptoms of ileus, and patient speedily died in spite of artificial anus. Autopsy revealed a lipoma, size of an orange, located in the rectum, producing an invagination of the bowel.

10. BROHL (*Disserl. Würz.*, 1886) cites case of female, aged forty years. Patient gave the history of abdominal pain of fifteen years' duration. For a year prior to onset she experienced a sense of something coming down. Examination of rectum demonstrated descent of invaginated lipoma, later confirmed by histological examination.

11. TREVES (Leipzig, 1888) reports the case of a female, aged eighty-three years, who had previous history of indigestion and colicky pain. Diarrhœa alternated with constipation, and finally a lipomatous polyp was discharged. Microscope confirmed diagnosis of lipoma.

12. STUDSGAARD (*Nord. med. Arkiv.*, 1894) reports a case of a female, aged forty-two years. Laparotomy displayed an irreducible intussusception of the jejunum, requiring resection. Patient died of peritonitis in five days. Pathological diagnosis: polyp, lipoma.

13. MARCHAND (*Berlin. klin. Wochenschrift*, No. 6, p. 135. Aerzlich, Verein zu Marburg, Case 3, 1896) cites case of a male, aged twenty-three years, who gave the previous history of having fallen on side while dancing. Onset was marked by acute pain, vomiting, and symptoms of intestinal obstruction. An enterostomy was performed on the fifth day for supposed obstruction; ileocolic into descending colon; death. Pathological examination demonstrated a subserous lipoma of cæcum.

14. HILLER (Bruns, *Beiträge zur klin. Chirurgie*, 1899, xxiv, p. 509) reports the case of a male, aged fifty-one years. The attack began with occasional pain and vomiting, constipation, rectal tenesmus, and moderate abdominal distention. At operation, attempt at reduction of iliac invagination produced a tear, necessitating resection and end-to-end anastomosis. Patient died. Pathological examination showed the intussusception to be due to a submucous lipoma.

15. BRUNNER (Bruns, *Beiträge zur klin. Chirurgie*, 1900, xxv, p. 344) reports the case of a male, aged fifty-one years. His attack consisted of pain of six days' duration, absolute constipation, rectal tenesmus, blood and mucus, abdominal distention and rigidity, and palpable tumor within sphincter ani. Operative procedure consisted of removal of tumor per anum, followed by laparotomy and colostomy, with subsequent closure of artificial anus. Patient recovered. Pathological diagnosis: submucous lipoma.

16. HAASLER (Langenbeck, *Arch. f. klin. Chirurgie*, 1902) reports the case of a male, aged twenty-five years. Attack was of one week in duration, beginning with sudden pain, vomiting, and diarrhœa. Rectal examination revealed pus, and a tumor was palpable to the left of the umbilicus. Operation consisted of resection of transverse colon and removal of mass, size of three fists. Pathological examination demonstrated a submucous lipoma at apex of intussusception. Recovery.

17. ZUM BUSCH (*Cent. f. Chir.*, 1903, p. 733) reports the very interesting and unique case of a male, aged twenty-one years, who for fourteen months had dull pain about umbilicus, with alternating constipation and diarrhœa. The patient was an athlete, accustomed to holding several men upon his abdomen. The acute attack began with vomiting, associated with frequent fluid stools and great tenesmus. Tumor was demonstrable and rigidity was present in the lower right quadrant. Rectal examination revealed blood. Laparotomy displayed a gangrenous condition of the bowel, rendering reduction difficult and demanding resection, followed by side-to-side anastomosis. Intussusception proved to be ileocolic and contained a tumor. The tumor proved to be an inverted Meckel's diverticulum, with a subserous lipoma at apex. Recovery.

18. RAY (*Lancet*, 1905, i, 567) cites the case of a female, aged thirty years, having had pain for six months in left iliac and lumbar regions, chiefly during and after defecation. For forty-eight hours previous to operation she had severe pain and vomiting. Enema caused tumor to protrude from anus. Operation consisted of reduction and removal of growth through enterotomy of sigmoid. Pathologically, a subserous lipoma was diagnosticated. Recovery.

19. LORENZ (*Jahr. d. zw. ch. klinik.*, Wiesbaden, 1906–07, 41 to 44) reports the case of a male, aged fifty-eight years, whose attack began gradually with symptoms of chronic intestinal stenosis. A sausage-shaped, transverse, alternately hard and soft tumor was palpable in abdomen. Laparotomy revealed an ileocæcal invagination with tumor on ileocæcal valve. The lower ileum, cæcum, and ascending colon were resected. Pathological examination demonstrated lipoma. Recovery.

20. WHARTON reports a case of intussusception due to lipoma and causing acute intestinal obstruction. (See above, Case I.)

21. FINNEY reports an almost identical case. (See above, Case II.)

Although intussusception is in the vast majority of cases an accident of childhood, indeed, not more than 1 to 30 per cent. of cases occurring in adults, it is not proposed to digress from the subject under consideration further than to note that Clubbe (The Diagnosis and Treatment of Intussusception, 1907), in his splendid monograph on this subject, reports a personal experience with 144 cases, only 14 of which were over one year of age. One hundred and twenty-four laparotomies were performed, with a mortality of 32.2 per cent. In no case was a tumor, much less a lipoma, the cause of the intestinal invagination. Indeed, the etiological influence of tumor in the production of intussusception seems to be restricted entirely to adult life. These tumors may be benign or malignant. Under the benign may be classified polyp, lipoma, adenoma, fibroma, myofibroma, myxoma, myxofibroma, papilloma, and cyst. The tumor is practically always affixed to the apex of the invagination. The malignant tumors are essentially degenerations of primarily benign neoplasms.

It can be no longer doubted that simple intussusception is most always induced by irregular and increased peristaltic activity of the intestines. This explains why children, in whom peristalsis is most active, become the usual victims of this accident. On the other hand, not only for the child but

for the adult as well, there are certain anatomical factors, associated with or without trauma, which play an important rôle in the production of intestinal invagination. They are the difference in diameter of the ileum and cæcum, prolapse of the mucosa of the ileum, abnormal mobility of the mesentery, benign and malignant tumors of the intestine, intra-intestinal foreign bodies, and finally certain para-intestinal appendages, as appendices and inverted Meckel's diverticula.

Of these causes producing acute intestinal obstruction due to intussusception we will consider only lipoma. A review of the 21 cases abstracted above reveals the fact that there are only seven successful laparotomies, involving a resection or an enterotomy; of these the present report contributes two. Although 12 recoveries are recorded, and the result not stated in three, in a number of the cases it will be seen that either a spontaneous cure occurred by sloughing away of the intussusception, or an excision of the intussusception and tumor per rectum was performed. Six patients died. Below are tabulated the seven successfully laparotomied cases of intussusception due to lipomata producing acute intestinal obstruction.

It is noteworthy that the mortality is highest when the attack is very acute and the obstruction complete; also, that when the onset is not so sudden the lipoma is larger, but located in the colon, having a large lumen. An analysis of the cases relative to the location of the lipomata demonstrates the following:

Cæcum	1
Descending colon	3
Ileocolic	2
Ileum	1
Jejunum	1
Rectum	3
Sigmoid	4
Transverse colon	1
Not stated	5
	21

Obviously, we cannot agree with Eliot and Corscaden ("Insussusception, with Special Reference to Adults,"

CASES OF INTUSSUSCEPTION DUE TO LIPOMA SUCCESSFULLY OPERATED BY LAPAROTOMY IN ACUTE INTESTINAL OBSTRUCTION.

Number	Reporter and year.	Sex.	Age.	Prior history.	Onset.		Conditions of intestines.	Rectal findings.			Abdominal findings.			Operation.	Site.	Pathology.	Result.
					Acute.	Chronic.		Tumor.	Blood.	Mucus.	Tumor.	Distention.	Rigidity.				
1	Brunner 1900	M	51	Negative	+	−	Constipation	+	+	+	−	+	+	*a*, Excision per anum *b*, Laparotomy *c*, Colostomy	Rectum	Submucous lipoma	Recovery
2	Hassler 1902	M	25	Negative	+	−	Spurious diarrhœa	−	−	+	+	+	−	Resection	Transverse colon	Submucous lipoma	Recovery
3	Zum Busch . 1903	M	21	Dull pain about umbilicus for 14 months	+	−	±	−	+	−	+	−	+	Resection	Ileocæcal	Inverted Meckel's diverticulum with subserous lipoma at apex	Recovery
4	Ray..... 1905	F	30	Pain on defecation for 6 months in left iliac and lumbar regions	+	−	Constipation	+½	−	−	−	+	+	Colotomy	Sigmoid	Subserous lipoma	Recovery
5	Lorenz..... 1906	M	58	Symptoms of chronic intestinal stenosis	−	+	?	−	?	?	+	−	−	Resection	Ileocæcal	Lipoma	Recovery
6	Wharton ... 1911	F	33	Negative	+	−	±	−	+	+	+	−	−	Resection	Descending colon	Subserous lipoma	Recovery
7	Finney..... 1911	M	35	Negative	+	−	Spurious diarrhœa	−	+	+	−	−	+	Resection	Descending colon	Lipoma	Recovery

ANNALS OF SURGERY, February, 1911) in the statement that "intussusception occurring in connection with benign growths in the large intestine are situated in either the sigmoid or rectum." These lipomata are usually single, but may be multiple, as in Sangalli's case. Histologically, they can be classified as subserous and submucous. The former arise from a hyperplasia of the epiplois appendices, which, by their growth may invaginate the bowel and then by traction provoke an intussusception. The latter are alleged to cause the largest lipomata occurring in the colon and rectum, and find their origin in the submucosa. Although in the majority of collected cases this differentiation is not noted, and of the cases where the variety is stated there are 5 submucous to 4 subserous, we believe that in the future with more complete and accurate histopathological examinations this order may be reversed.

The male sex has been slightly more frequently afflicted.

Aside from the fact that intussusception due to lipoma is a disease of adult life, age is no criterion, as the condition has been found at all ages from twenty-one to eighty-three, although usually prior to the fifth decade of life. There may or may not be a previous history of abdominal pain and intestinal stenosis. The symptoms are, of course, those typical of acute intestinal obstruction when the attack makes its appearance, not infrequently, however, preceded by a period of intermittent symptoms of partial obstruction. Commonly, the diagnosis of intussusception can be made by the exclusion of other possible causes, the presence of a palpable mass in the abdomen or rectum, and rectal tenesmus, blood, and mucus. The cause of the intussusception, however, is only discovered at operation or by the pathologist. The prognosis is always grave. It may be summed up in three words, the *deeper the better,* that is, the mortality is much less if the invagination occurs in the colon than if it takes place in the small intestine, and less in the descending than in the ascending colon.

The treatment of intussusception due to lipoma is always

operative. Although a small percentage of cases have been and will be cured by spontaneous discharge of the intussusceptum and lipoma, to expect such a sequence would be the height of folly. Too much emphasis cannot be placed upon the earliness of operation. Care must be observed in attempting to disinvaginate the bowel, nor must much time be devoted to such an attempt. The best course is to reduce as much of the intussusception as may be quickly and easily accomplished, followed by enterotomy and the excision of the lipoma or intussusceptum plus lipoma, or preferably resection of the entire intussusceptum, which must necessarily be the procedure if the tumor has undergone malignant degeneration or has a broad sessile attachment to the intestine, or the gut is found to be gangrenous. On the other hand, if the patient be an adult and his condition precarious, inguinal colostomy or ileocolostomy may be performed advantageously. The operation of artificial anus as a palliative procedure for this condition in an infant should never be practised, as they invariably succumb. The lesser of the two evils is always to resect, although the prospect is hopeless. Should the lipoma and intussusceptum present at the anus, resection or excision per rectum, followed immediately by laparotomy to secure the continuity of the colon, is the preferable course to pursue.

SUPPURATION IN HALF OF A HORSESHOE KIDNEY.*

BY JAMES E. THOMPSON, F.R.C.S.(Eng.),

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HORSESHOE kidney is not of very frequent occurrence. Both found it five times in 1630 autopsies at Basel (*i.e.*, in 0.3 per cent.); in 832 male cadavers twice (0.24 per cent.); in 798 females three times (0.37 per cent.). Although statistics vary, these figures may be taken as fairly representative, and we may expect horseshoe kidney in one cadaver out of 300. It will be seen that this is not quite a negligible quantity; and the frequency of the condition demands that at least a thought should be given to the possibility of its presence when dealing with any renal or obscure abdominopelvic tumor.

The case that forms the basis of this paper was one of pyonephrosis, occurring in a young girl fifteen years of age, who presented symptoms pointing very strongly to a diagnosis of renal calculus.

CASE I.—*History.*—A. M., aged fifteen, a well-nourished girl, came under my care in July, 1908. For six years she had suffered from pain in the left side. The situation of the pain was in the lower part of the lumbar region and the left iliac fossa. It was more or less constant, and was associated with irritability of the bladder, shown by frequent painful urination. At irregular intervals it was paroxysmal and very intense, at which periods it was accompanied by severe chills and high fever. No change had been noticed in the quantity of the urine, nor had the quality been altered up to two months before examination, when it became turbid and of an offensive odor. At no time had any blood been noticed in the urine, nor had gravel or anything resembling stones been passed. During the last two months the paroxysms of pain had been so frequent that the parents were very anxious for some medical treatment.

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* Read before the American Surgical Association, June 19, 1911.

Examination.—The urine was slightly alkaline; specific gravity 1022; contained quantities of pus. It was free from tubercle bacilli, but contained myriads of colon bacilli. There were no crystals. Physical examination revealed very little. No swelling could be felt in either loin or groin, but pressure in the left iliac fossa elicited some pain.

Operation.—As the child had never menstruated and was extremely nervous, no vaginal examination was made, but an anæsthetic was given and arrangements made to do a radical operation if it was found necessary. Under the anæsthetic a slight swelling was found in the upper part of the left iliac fossa, and it was decided to make a low lumbar incision and explore it retroperitoneally. An incision was made like that formerly employed for the retroperitoneal exposure of the common iliac artery. A flattened cystic tumor was found lying in the iliac fossa and extending as far as the brim of the pelvis. Absence of the left kidney was demonstrated in its normal lumbar position, so it was decided that the tumor was probably a misplaced kidney. While it was being exposed and isolated, an opening was accidentally made into one of the cystic swellings, out of which pus flowed. The interior of the cysts was now explored, but no stones were found. That it was without doubt the kidney was easily shown by the blood-vessels, which entered the mesial and upper border, while the ureter came out of the same border and coursed over the front of the swelling on its way to the bladder. While the lower end of the kidney was being isolated, it was seen to narrow materially into a kind of neck and then to expand immediately into a mass that lay transversely over the front of the last lumbar vertebra. Thinking of horseshoe kidney, I examined this mass carefully, and satisfied myself that it was the right kidney. A clamp was applied to the narrow neck, the intervening glandular tissue was crushed, and a ligature applied in the groove, after which the left diseased kidney was removed. The ureter was very short (about 1½ inches long), and it was ligatured close to the bladder, the cut end being disinfected with phenol.

Convalescence was uninterrupted, the right kidney being able to carry on the excretory functions without difficulty.

Pathologic Specimen.—The removed organ was a typically dilated pyonephrotic kidney, exactly the counterpart of many kidneys the seat of

renal calculi. The cavities contained thin purulent urine, and were only moderately distended. No signs of calculi were discovered, nor was there any evidence of tuberculosis. The organ was flattened at the time of observation, and it was evident that drainage along the ureter had been very free.

It is possible that the kidney at one time had been the seat of one or more calculi, which at some time previous to the operation had become disintegrated and passed out without the patient's knowledge. But, on the other hand, it is just as probable that the case was one of primary hydronephrosis which had become infected secondarily with pyogenic organisms (colon bacilli), weight being given to this latter suggestion by the frequency with which horseshoe kidneys show evidence of hydronephrosis in greater or less degree.

The tendency of horseshoe kidneys to become diseased is very marked, and I have been able to find records of six cases of hydronephrosis (Socin,[1] Barth,[2] Israel[3] and Geiss[4]); of five cases of calculus (Phillips,[5] Braun,[6] Rumpel,[7] Israel and Schuchardt[8]); one case of sarcoma (Koenig[9]), and one case of pyonephrosia (Sutherland and Eddington[10]) unassociated with calculus. Of these only three can be characterized as cases of pyonephrosis (Phillips's, Braun's, and Sutherland and Eddington's). One (Sutherland and Eddington's) was a case of pure pyonephrosis unassociated with either tubercle or stone. In which respect it resembles the case that forms the subject of this paper. The other two were cases of calculous pyonephrosis (Phillips's and Braun's) and one of them is remarkable, owing to the fact that both sides of the kidney were infected and contained stones. Only one of the patients (Braun's) was operated on and this case proved fatal from hemorrhage, caused by tearing the left renal vein. The history of these three cases I have appended below.

CASE II (Reported by SUTHERLAND and EDDINGTON [10]).—The specimen was removed post mortem, from a male child, aged three years. Pus had been observed in the urine for two months before operation. An abscess in the lumbar region was opened, and continued discharging until death.

Pathologic Specimen.—The conjoined kidney was shown in section,

and the two halves were seen to be joined by a broad isthmus of renal tissue. The left side of the specimen was seen to be greatly enlarged. The pelvis was dilated, and there were cavities representing dilated calices which largely replaced the renal tissue and still contained remains of pus. The left half of the isthmus showed a similar lesion. The right side of the specimen and corresponding portion of the isthmus were normal. In addition, there was an abscess cavity outside the left kidney communicating with the internal cavities. Microscopically examined, the lesion in the kidney presented the characters of an ordinary pyonephrosis. There was no evidence of tubercle. The right half of this fused kidney presented microscopically a normal structure.

CASE III.—Horseshoe kidney, one-half normal, and the other half showing pyelonephritic changes. (Reported by H. BRAUN,[4] professor of Surgery at Heidelberg.)

History.—A woman, aged forty-five, was admitted to Czerny's clinic, February, 1881. Previous history good. Present trouble began in 1879, with severe pains in right iliac region, accompanied by cloudy urine, with heavy sediment, but no admixture of blood. Six months before examination anorexia appeared, which resulted in considerable emaciation.

Examination.—There was uniform distention of the lower portion of the abdomen. A tumor the size of the head was palpable, of firm consistence; no fluctuation could be discerned. Exploratory puncture resulted negatively. The urine, drawn with catheter, contained a large amount of albumin and pus; no other abnormal findings. There was enlargement of abdominal lymphatics in the region of the tumor. Probable diagnosis: pus in pelvis of kidney.

Operation (March 7, 1881).—In the attempt to loosen the tumor it was found that it was firmly united posteriorly with the aorta and vena cava; venous hemorrhage occurred, which could with difficulty be controlled by ligatures. Operation had to remain unfinished; patient did not regain consciousness, but died while abdominal wound was being closed.

Autopsy.—This showed horseshoe kidney, one part of which (the left) was normal, the other (the right) showing pyelonephritic changes. The pelvis of the kidney and calices were considerably dilated and contained six voluminous arborizing calculi, with a longitudinal diameter of 7 cm. and a thickness of 2.5 cm. The right ureter, which passed, like the left, over the anterior surface of the tumor, was dilated and firmly enclosed in a capsule of firm consistence. The left renal vein derived several branches from the pelvis of the kidney. The right renal vein and the two renal arteries were normal. The hemorrhage during the operation was occasioned by injury to the right renal vein, just immediately before its opening into the interior vena cava. Posteriorly, the tumor was firmly attached to the aorta and the vena cava.

CASE IV.—Renal calculus in connection with a horseshoe kidney (reported by N. R. PHILLIPS[5]).

History.—W. M., aged forty-one, admitted to hospital under care of Dr. Whitehead Reid, May 31, 1902. At the age of three he had passed with his urine a stone about the size of a barley-corn. At 20 he

passed a "mulberry" calculus the size of a haricot bean. He only once passed blood with the urine; this was at the age of 21. At 28 he became ill with cystitis and had never been quite well since. The urine became thick and sticky; there was pain in the loins and both groins, especially the right, which was worse after exercise. He had lost flesh during the last twelve months and had become very weak. He had been sent to the hospital with a diagnosis of intestinal obstruction. He was very sallow and in an extremely debilitated condition; the pulse was rapid and of very low tension. There was some indefinite resistance to be made out in the right hypogastric region, but no bulging in the loins. There was a history of nine days' constipation, and vomiting had become almost incessant. The urine was neutral in reaction, viscid, and half pus. The bowels were moved after repeated enemas. The bladder was sounded, but no stone could be detected. An operation on the kidneys was considered inadvisable on account of the great state of exhaustion.

Autopsy.—Kidney was found to be horseshoe-shaped, the two lateral portions being united below. On the right side the kidney was greatly distended, and formed a large cystic swelling. Both sides were firmly bound down by adhesions to the posterior abdominal wall. The right ureter was imbedded in a large mass of fat. On section of the right half of the kidney a large quantity of pus escaped, and nothing remained of the kidney substance but a thin-walled sac. Two faceted calculi were lodged in the commencement of the ureter. The left half, on section, was also found to contain pus; the pelvis was greatly dilated and occupied by a very large branching calculus, which extended into the kidney substance, so that the latter merely formed a thin coating for the stone. The weight of the kidney, including three calculi, after removal of the pus, was 22.5 ounces.

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[3] Israel: Palpationsbefunde bei Hufeisennieren, Centralbl. f. Chir., 1904, No. 10, p. 302.

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[5] Phillips, N. R.: Renal Calculus in Connection, with a Horseshoe Kidney, Brit. Med. Jour., Feb. 21, 1903, p. 426.

[6] Braun, H.: Ueber Nierenextirpationen, Deutsch. med. Wchnschr., July 30, 1881, p. 421.

[7] Rumpel, O.: Ein Fall von Nephrolithiasis bei bestehender Hufeisenniere, Centralbl. f. Chir., 1902, xxix, 1091.

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[9] Koenig: Deutsch. Ztschr. f. Chir., xl, 92.

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SURGICAL TREATMENT OF FISTULA IN ANO WITHOUT MUTILATION OF THE SPHINCTER.

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THE object of this study is not to advocate a new method, because it would appear that in the search of new methods in this, as in all branches of surgery, it is found that "there is nothing new under the sun."

The writer of late has found a few cases of anal fistulæ in which a departure from present standards has seemed to be productive of results, apparently shortening the term of treatment and obviating the disagreeable consequences of the radical operations at present in vogue. The fact that the method has been used mainly in inveterate cases, which in some instances had resisted all manner of topical and operative treatment over long periods of time, furnishes the hope that the method proposed will fit into a large enough number of cases to justify its *raison d'être*.

It is not intended to include in the scope of this study all varieties of fistulæ that are found affecting the rectum and its neighborhood. Obviously enough it is proper to exclude those forms which are strictly extrinsic and which originate, for example, in diseases of the pelvic bones, diseases of the bladder, prostate, urethra, and other contiguous organs and parts which extend very readily to the perirectal tissues and ultimately invade the bowel, simulating very closely the types under consideration.

For the same reason fistulæ that have a specific constitutional origin are excluded, except the tuberculous forms which afford special indication for the method of treatment herein advocated.

Almost uniformly the accepted treatment of complete fistula in ano consists of the complete division of the structures involved between the two ends of the fistulous tract, and in the incomplete forms the rule has been to create a terminal orifice by force either within or without and lay bare the tract, forcing the surface to heal by granulation.

In the case of simple, submucous anal fistula the method is without fault. In the varieties of rectal fistula, having their internal terminus without the bounds of the internal sphincter or between the sphincters, the method is also applicable, notwithstanding the fact that even in these cases a partial loss of sphincter control occasionally results.

In that group of cases in which the fistulous tract has its internal orifice beginning at some point within and above the internal sphincter or in some part of the rectal wall the effect of the complete section of the structures involved always results in some degree of impairment of sphincter control, causing very often a state in which there is much inconvenience and discomfort, if not abject misery.

Methods of operation have been devised to obviate these results, but almost without exception the treatment of fistula in ano stands as it stood one hundred years ago.

The first and practically the only radical departure from old methods was the complete resection of the fistulous tract beyond its bounds and its subsequent suture. This method has been successful in selected cases generally speaking, when the infective process had ceased in a single, direct, fistulous tract, rendered sterile through lapse of time. It has failed so often and so frequently made a bad state worse that it is safe to say that the tendency of surgeons is to abandon it. It is absolutely contraindicated in infective states and in complex rectal fistulæ.

A study of the distribution and direction of rectal fistulæ based upon anatomic lines of cleavage is all-important in this study. Rectal fistulæ undoubtedly originate within and without the bowel. A streptococcus or mixed infection of the integuments covering the buttocks will sometimes penetrate

the planes of fascia, and, following the trail of the lymphatics and vessels, and lines of least resistance, lead to the rectal wall and penetrate. That complete and incomplete forms of fistulæ with all manner of ramifications may originate in this way is without doubt.

The greatest number of fistulæ of the type with which this study deals originate within the bowel, and the internal orifice of the tract will be found in most cases at the anorectal junction, generally speaking within the posterior quadrant of the anal ring.

The sequence of events is: (1) diminished resistance, (2) trauma, (3) invasion of micro-organisms, (4) ulceration, (5) perforation, (6) infiltration of the fat layers, (7) formation of abscess. The spread of the abscess afterward and its final localization determine the fistulous tracts and zone.

It is believed that fully three-fourths of all rectal fistulæ originate within the lumen of the bowel. The tendency of fistulæ which result from ischiorectal abscesses originating without is to perforate the rectal wall above the level of the external sphincter; whereas, rectal fistulæ which result from abscesses originating within the bowel tend to perforate through the sphincters or between them.

The submucous and the combined submucous and subcutaneous varieties afford exceptions to this rule, rising as they do at times to high levels in the rectal walls.

Stercoral or pressure ulcers are sometimes found in the sigmoid and rectum, which perforate and cause perirectal abscesses.

In the service of a colleague at the present time is a case of fistula, the outer opening of which is in the right groin, the internal opening beyond the reach of the sigmoidoscope, situated probably in some part of the colon. Water forced into the rectum makes its escape freely through the fistulous tract. The history of this case makes it evident that the ulcer was the result of chronic constipation.

When an ulcer perforates the rectal wall and an abscess emerges, its course and spread are determined by various

factors. If the abscess is small, the resistance strong, and the inflammatory action moderate, it may take a straight course to the surface and point, leading to the formation of a single, straight, direct tract, which after a variable period of activity will contract and form a canal with a dense, limiting, fibrous wall.

This is the simplest type of fistula and is amenable to easy surgical cure, yielding readily even to proper topical treatment. Such fistulæ as these, because of their accessibility, will often yield to the use of Beck's paste, which obviously enough would not avail in the treatment of the complex forms herein referred to.

The superimposed and concentric arrangement of the fat layers in the buttocks and perirectal region has a very important influence in determining not only the boundaries of any forming abscess, but the direction and distribution of the succeeding fistulous tracts; thus, an abscess which has left the rectal wall may course into the deepest layers of the fat next to the gluteal muscles, and in this plane of fat and connective tissue, divide and subdivide into branches, which, turning hither and thither, become lost in blind ends in the fat, giving no evidence of their existence by any palpable or visible signs without; draining, however, toward the skin and finding an outlet at or near the anal margin. In like manner the abscess may emerge from the point of perforation in the rectal wall in any one of the well-marked layers of connective tissue or occupy each layer definitely.

In other instances the spread and distribution of the fistula is general, with all the fat layers and fossæ involved, the whole region then becoming literally honeycombed with fistulous tracts, all draining toward a common point without.

This tendency of rectal fistulæ to follow definitely the planes of tissue is even seen in the most superficial varieties, which are typified in those not uncommon forms in which the abscess and its succeeding fistulæ are strictly submucous, subcutaneous, or both combined.

In peri-, retro-, and ischiorectal abscesses the lines of cleavage are followed in the same general way. In the first two varieties the abscess may take a course upward and perforate the rectal wall above the sphincter level or even above the levator ani muscle, or course downward and point in the usual situation. In the former event the discovery of the fistula may be difficult; in the latter it may be mistaken for and incorrectly treated on the same lines as the so-called blind external fistula.

The most complex form of rectal fistula is that which, on one or both sides of the rectum, has branches like the tentacles of an octopus, passing into the various fat fossæ surrounding the bowel and burrowing deep into the fat layers covering the buttocks, having, perhaps, only one outlet. This type of fistula, which on the surface may have all the earmarks of a simple fistula, may be approached by a radical process of treatment with a very reasonable prospect of complete cure, but not by the methods commonly in vogue.

The examination of a large segment of the buttock which was resected for the cure of one of the cases referred to in this study illustrates in a striking manner the tendency of anorectal fistulæ after perforating the rectal wall to occupy one or other or all of the fat layers by branching in various directions, at times pointing to the surface but more frequently terminating in blind ends within the layers occupied, all converging like the branches of a river into one channel.

In the same specimen was seen, following the same distribution, many branching lines of cicatricial tissue, showing that some of the sinuses had healed, while others seemed to be in the course of a slow process of extinction.

Surgeons who have observed this complex type of fistula will agree that the operative measures in common use not infrequently fail even when the most radical steps are taken. The reason is plain. If a complete section is made of the fistulous tract into the rectum, including the division of one or both the sphincters, and all care is taken to lay

bare all visible and accessible tracts, if one of the many branching tracts remain, and it is impossible in many cases to note them all, it may be laid down as a law and for the most obvious reasons that the fistula will persist *in situ*. So often is this result observed that the fistula under the conditions named could very well be termed the " paradoxical " fistula.

Several cases have been observed in which apparently very complete operations were performed by different operators, and in all the last condition, if anything, was worse than the first, the fistula persisting *in loco* with some degree of incontinence a feature of all.

Why does the fistula persist? Plainly the answer is that, whereas the main fistula was properly attacked and a complete section made of the intervening tissue into the bowel, some remote branch or feeders some distance removed from the field of operation, concealed in one or other of the fat layers, remained to determine a relapse of the morbid process. The ultimate result of incontinence in these cases which was not the result of the first, but rather the continuous effect of the later operations, is explained on the ground that the first incision divided the external sphincter completely and the internal sphincter in part only, leaving enough power in both to control the bowel adequately; the succeeding operations performed in exactly the same region and on the same theory of treatment, dividing more and more of the internal sphincter, of necessity the time comes at last when the remnant of the sphincter is divided, incontinence thereupon resulting.

It will sometimes happen that the abscess on emerging from the rectal wall will invade both sides simultaneously, or if one side alone is invaded the process may readily extend to the opposite side, causing ultimately a symmetrical distribution of fistulæ of the character described in both buttocks.

To this group belong the several varieties of so-called

horseshoe fistulæ, which more than all other forms of complex fistulæ require radical treatment.

According to Tuttle, in general hospital practice in this era of advanced surgery, operative failures in a large number of cases investigated amounted to 45 per cent.

Proctologists inveigh against these figures and protest that the operations are performed by incompetents, which term includes surgeons, and that in their hands the figures indicating failure would be negligible or nil. Is this true?

Certain facts must be connoted: (1) The divulsion of the sphincter alone is known to cause incontinence, even when done with care and without apparent damage to the fibres of the muscles other than their undue stretching. (2) The single simple section of the two sphincters at a correct angle will sometimes cause incontinence, and there are added dangers when the section of the sphincter is associated with its previous complete divulsion. (3) The single, simple section of the external sphincter alone at a correct angle is also known to cause well-marked incontinence. (4) It is held by competent authorities that incontinence may be caused by division of one or other of the nerves supplying the parts in question. Unfortunately, for the force of this particular argument, anatomists have not yet made clear the exact manner of the end distribution of the nerve supply of this peculiar group of muscles. If one could imagine a single nerve-trunk reaching a circular muscle like the external sphincter and furnishing half of its circumference with the power of motion and control, one could readily understand that its division could easily be effected by a fortuitous cut properly directed with reference to mere technic and cause a hopeless paralysis of the part. However strong the asseverations of writers and others that operative failures and incontinence following surgical procedure are a reproach to surgery and a stigma on the particular operator who meets them, the fact remains that there are abundant reasons for their occurrence apart from any system of treatment, and that every surgeon and proctologist, if he tell the truth, will admit a

very considerable percentage of operative failures and an occasional case of incontinence as long, at least, as present surgical methods are in vogue.

It is thought that one of the factors that has retarded the progress of surgery in the treatment of anorectal fistulæ is the paramount position that has been given to the principle of drainage in the treatment of this disorder.

A minute study of a fistulous channel with all its ramifications reveals readily that its drainage is usually free, continuous, and sufficient, and that once the fistulous tract has been established, it is not subject to those complications which arise from defective drainage, and that even when the evidence is presented of defective drainage in the presence of a freshly formed abscess, careful scrutiny will show that it was not so much the result of defective drainage as renewed infection or reinfection of a part highly susceptible and continuously exposed to bizarre and multiform infective processes.

The state of perpetual unrest of the parts is the great predisposing factor and, on the other hand, in certain groups of cases infection is maintained *in loco* by repeated trauma, while in other reinfection takes place intermittently by the passage of fresh hosts of organisms from the neighboring bowel.

The principle of drainage is conceded to be paramount in the treatment of all abscesses that develop in the neighborhood of the rectum, and executed properly would in all cases prevent the development of fistulæ. It is held, on the other hand, that in the treatment of rectal fistulæ, in order to compass their radical cure, the principle of drainage must yield to some means which will do for the relief of fistulæ what drainage does for abscess, and this brings us to the consideration of a wider application of the principle of extirpation for the cure of fistula in ano than has been heretofore considered.

It is proposed to proceed by the following steps:

1. The patient is prepared in the most careful way as for any major surgical operation on these parts.

2. The sphincter is completely dilated.

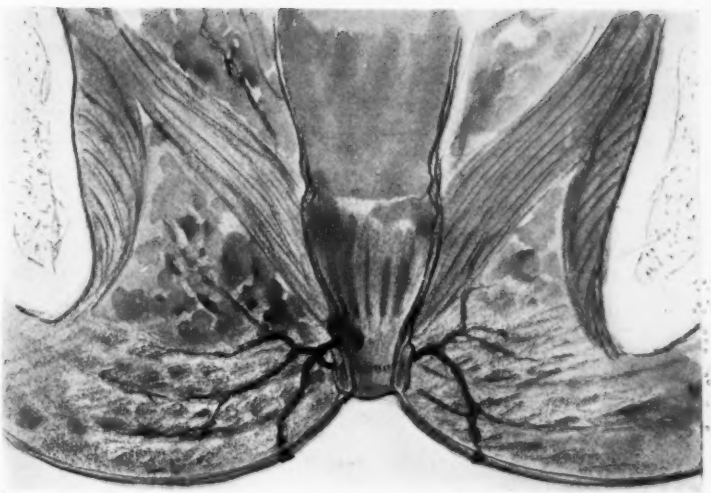
3. The internal orifice of the fistula is minutely examined and with a proper instrument is very cautiously dilated. After dilatation the mucosa is uplifted and pared with curved scissors in the direction of the long axis of the bowel, and with a small knife or fine scissors the circumference of the muscular layer is then trimmed and vivified. If need be, the opening may be incised or split in the direction of the circumference of the sphincter. After this has been done a few interrupted sutures of iodized catgut are introduced in the muscular layer at right angles with the sphincter, tied and divided. The mucous membrane is then sutured with interrupted chromic catgut or silk sutures, properly spaced. If more than one orifice exists, of course the same procedure is followed.

4. A flap is made on the side involved, beginning by making a small semilunar incision just beyond the border of the external sphincter, dividing the parts down to the fistulous tract, the latter being divided flush at its point of emergence from the bowel. The incision is extended from both ends of the first incision outward and made large and deep enough to include, if possible, under the eye all visible and accessible branching tracts. The exigencies of the case may require sometimes the lifting of one or other of the buttocks in its entirety.

In one case, already referred to it was necessary to make a complete flap and partial resection of both buttocks in order to reach the deepest and most distant branching tracts.

5. The opposite side of the rectal opening is now attacked, and after all doubtful tissues have been removed the rectal walls are infolded once or twice over the line of suture within. The greatest care must be exercised in removing all doubtful tissues. If need be the cautery could be used for

FIG. 1.

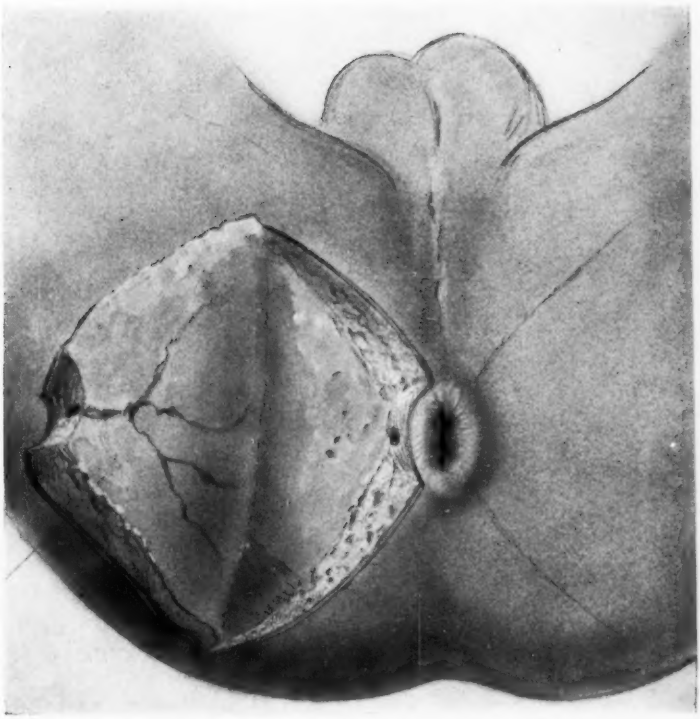


Sectional view of pelvis showing tendency of complex anorectal fistula to branch into any one or all of the concentric layers of fat in the buttocks and rectal fossæ, and to terminate in blind ends (diagrammatic).

FIG. 2.

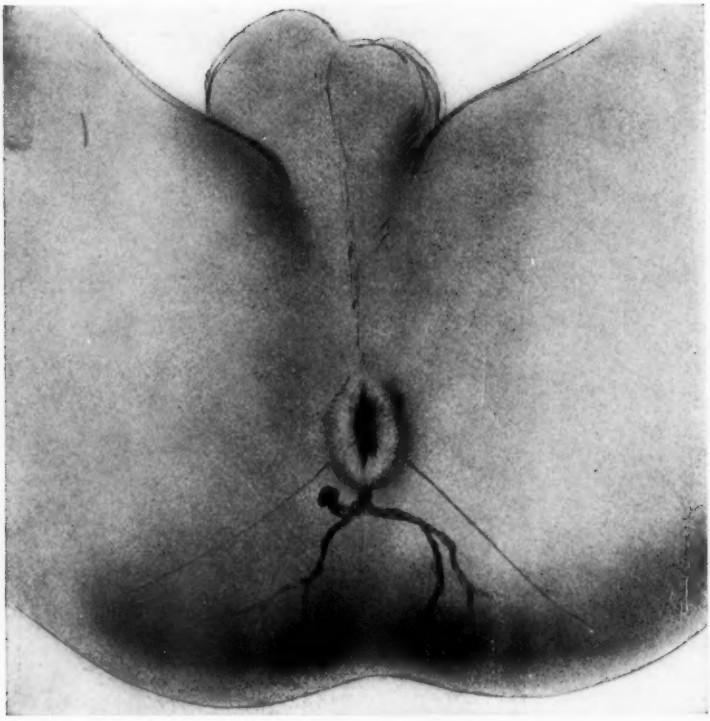
Proximate and distant branching and symmetrical spread of horseshoe fistula, having two orifices without opening within the bowel. Scheme of flap formation for adapted cases.

FIG. 3.



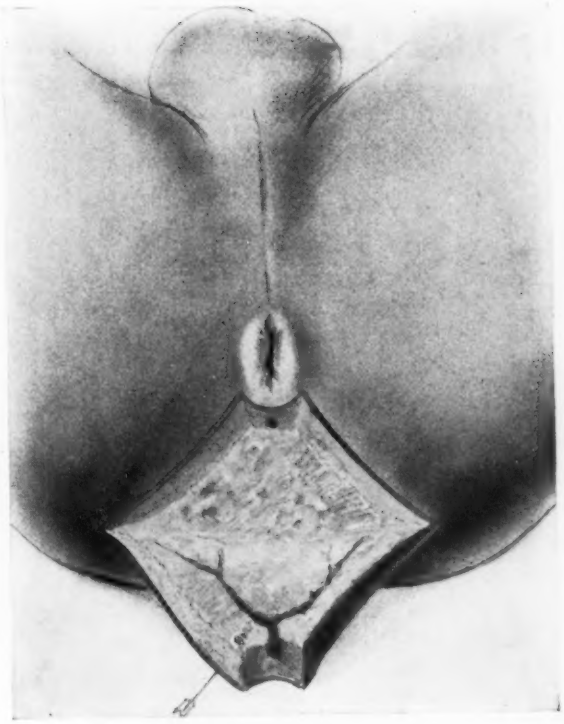
Trap-door flap lifted and fistula with all its branches reflected in the flap. Scheme of extirpation and approach to the outside of the rectal opening of the fistula.

FIG. 4



Complex anorectal fistula tracking backward; branching scheme of flap formation for adapted cases.

FIG. 5.



Flap reflected with contained fistulous tract, preparatory to extirpation.

their complete destruction, or substituted entirely for the suture of these parts.

6. The exposed flap is next attacked with knife or large pointed scissors curved on the flat, and the original tract, its branches, and the entire fistulous zone including every branching tract resected. Careful search will be made in the ischiorectal fossa and perirectal spaces for any concealed tracts.

7. The whole field is then carefully flushed with normal salt solution, and, if need be, antiseptisized and the fat layers sutured with buried catgut so as to close all dead spaces. In many cases the entire wound may be closed as in the case of breast amputation, or a small drain may be left for twenty-four or forty-eight hours.

REPORT OF TWO EXTREME CASES OF COMPLETE FISTULA (INVETERATE FORMS) RELIEVED BY THIS METHOD OF OPERATION.

CASE I.—W. G., aged seventy years, Civil War veteran. Developed in 1863 a rectal fistula on which many operations were done from time to time, the condition becoming more aggravated.

Original examination, September, 1909, revealed a single rectal gap with numerous branches extending into the ischiorectal fossæ on both sides and over the buttocks, branching under the skin on both sides of the scrotum and as high up as the groin, numerous openings discharging freely. Partial loss of control.

For relief of this case which had existed for forty-six years, both buttocks were lifted by large "trap-door" flaps and made to include as nearly as possible all branching tracts, resection of the fistula throughout the fat layers in the flaps, resection of all subcutaneous tracts with openings without. Suture of the rectum not necessary in this case. Partial resection of both flaps where tissues were unduly undermined. Replacement of the flaps by suture, closure of gaps by plastic procedure, moderate packing of open subcutaneous tracts. Complete healing of the entire area in three months. No recurrence.

CASE II.—Mrs. J. B., aged thirty-two years. Horseshoe

fistula, single opening in the posterior rectal wall at the ano-rectal junction, tracking backward toward the coccyx and sacrum, and branching into the fat of the gluteal folds, right and left. The condition had lasted four years.

Treated by incision on two or three different occasions. No rectal incontinence. The "trap-door" incision made behind the anus by method described, lifting the large flap which contained all branching tracts and scar tissue showing obliterated sinuses; complete extirpation of complete fistula; replacement of the flap; primary union. A slight shallow tract developed for a short time, which yielded very readily to moderate use of Beck's paste.

EVERTED DORSAL DISLOCATIONS OF THE HIP.*

BY OSCAR H. ALLIS, M.D.,

OF PHILADELPHIA.

WITH THE REPORT OF A CASE MISTAKEN FOR FRACTURE OF THE FEMORAL NECK.

BY JOHN B. ROBERTS, M.D.,

OF PHILADELPHIA.

In this variety of dislocation the foot is everted, while the head of the femur lies outward upon the dorsum of the ilium. This form of luxation of the head of the femur may be primary or secondary. By primary I mean that the head of the bone escapes from the socket while the femur is in a condition of external rotation, and the dislocation occurs with all the signs of dorsal dislocation *reversed*. In other words, the ordinary dorsal dislocation is attended with adduction of the knee and rotation inward of the femur and foot, and when the patient lies on his back the trochanter will be on a higher plane than the dislocated head, with the latter pointing inward and downward; while in dorsal dislocation with eversion of the foot the femur will not be adducted nor will it be rotated inward, but both the femur and the foot will be turned outward, and the great trochanter, instead of being on a higher level than the dislocated head, will be at a lower level when the patient is in the supine position.

I have seen one case of undoubted primary inverted dorsal dislocation of the hip.

A middle-aged man was leading a horse on a smooth icy road, when the animal reared, slipped, and fell. The horse fell upon the man, rendering him instantly helpless. He was conveyed to his home by a policeman, and through the courtesy of Dr. W. Stillwell I saw him an hour after the injury, before any attempt had been made at reduction. The limb was abducted

* Read before the American Surgical Association, June 19, 1911.

and flexed slightly at the hip and knee, occupying a constrained position, with the foot turned outward. The reduction was accomplished under ether in the following way: The pelvis of the patient, lying on his back, was first fastened securely to the floor by means of muslin bandages passed through hooks in the floor, situated at the borders of the pelvis and at the perineum. The leg was flexed on the thigh, the thigh on the pelvis, and traction was made directly upward until the head of the femur reached the level of the socket. The traction was next made inward toward the umbilicus, in order to bring the head over the socket, then the knee was carried downward and the head of the bone was found to have come into place. The patient returned to work in a few weeks.

Experimental work has demonstrated the possibility of primary everted dorsal dislocations. With the cadaver strapped firmly to a suitable table, the femur should be flexed to a right angle with the pelvis and the leg at a right angle to the thigh. The operator, standing on the right side, should steady the right knee with his left hand, and, seizing the right ankle with the right hand should rotate the femur by turning the ankle like the spoke of a wheel inward toward the pubes, with the femur slightly adducted. The rotation ruptures the capsule and the head falls outward. Then if the limb is extended, the symptoms of dorsal dislocation with eversion will be present. I have repeatedly produced the luxation by this manipulation, but have quite as frequently fractured the femur in the undertaking.

The secondary variety may be produced through unspent forces, converting a primary dorsal with inversion into a dorsal with eversion, or as is not uncommonly the case, it may occur as the result of unsuccessful attempts at reduction by means of manipulation with circumduction. This method has repeatedly converted a dorsal dislocation into a pubic or obturator and not infrequently has converted a dorsal with inversion into a dorsal with eversion. In the case reported by Dr. Roberts, attempts had been made to restore motion to a joint stiffened by chronic synovitis. In doing so the

capsule, which was softened and weakened by inflammatory processes, gave way, dislocation took place, and in attempting to restore it the condition shown in the X-ray picture was produced.

CASE REPORT BY DR. JOHN B. ROBERTS.

A rather stout married woman, aged twenty-six years, was put under my care for surgical treatment at the Methodist Hospital in November, 1910. She was evidently in good general health, but was confined to bed in the supine posture, because of pain and rigidity of the right hip and knee. She was unable to move the limb, and complained of great pain when any attempt was made to handle it or make an examination by means of active or passive motions.

She was free from fever, had a good appetite, and was cheerful and happy, if allowed to remain undisturbed, lying on her back with the two lower limbs parallel to each other. The right lower extremity was slightly œdematous over the tibia, appeared to be somewhat atrophied, and lay upon the bed in marked eversion, with the heel about opposite the internal malleolus of the left tibia. Voluntary motion of the limb hurt her, she said, and therefore no movements were made. Attempts at rotation made by me caused her to cry out with pain or fright, though some rotation was evidently possible. Passive flexion of hip and knee were impossible, but how much of the rigidity was due to pain and fear I could not determine.

Measurements from teeth, umbilicus, or anterior iliac spines to the malleoli showed the right limb to be about 1¾ inches shorter than the left. Measurements from the trunk to the patellæ and from the patellæ to the malleoli seemed to prove that about 1¼ inches of the shortening existed in the femoral section of the limb and about ¾ inch in the tibial section. These measurements, as is well known, are difficult to make with accuracy. Measurements to establish the relative position of the two great trochanters by the so-called Bryant's triangle gave about 1½ inches displacement upwards of the right trochanter.

When the patient was turned on her abdomen the right buttock was flattened, and the right leg appeared to be shorter than the left from trochanter to *heel* by about 1½ inches. No kyphosis

of the spine was found, and no definite account of a fracture of the limb was obtained.

My attempts to obtain a clear history of the condition previous to my first interview were unsatisfactory. After eliciting the objective facts just mentioned, I concluded that the woman was suffering from an old fracture of the neck of the femur, a rigid knee from continued immobility in the extended posture, and a hysteroidal condition of the nervous system.

The antecedent hospital notes were surgically rather desultory; but from them the following information was obtainable: The patient had been admitted about six weeks prior to my seeing her. She had stated that the present trouble dated from January, 1910, when rheumatism occurred in both legs. It was more severe in the right hip than in the left, and increased so much that she became delirious. The right leg became swollen and œdematous. This condition had lasted until she was admitted to the hospital. Then the right knee was found to be stiff in the extended position, but the principal trouble was the great pain in the hip of the same leg. Temperature, pulse, and respiration were normal. The examination of the chest, abdomen, pelvis, and urine was negative, and nothing unusual was found in her menstrual history. No tubercle bacilli were found in the blood.

The woman herself gave as her opinion that the hip trouble might have developed from a fall sustained four or five days prior to the onset of the pains, which her family physician had called rheumatism. At that time she had bruised the left leg only, did not seem much hurt, and had walked freely afterwards.

Four years previously she had given birth to her youngest child, six weeks after which she had had what was called typhoid fever for a few days. Prior to these occurrences there had been a sore on the vulva, but no subsequent symptoms had developed.

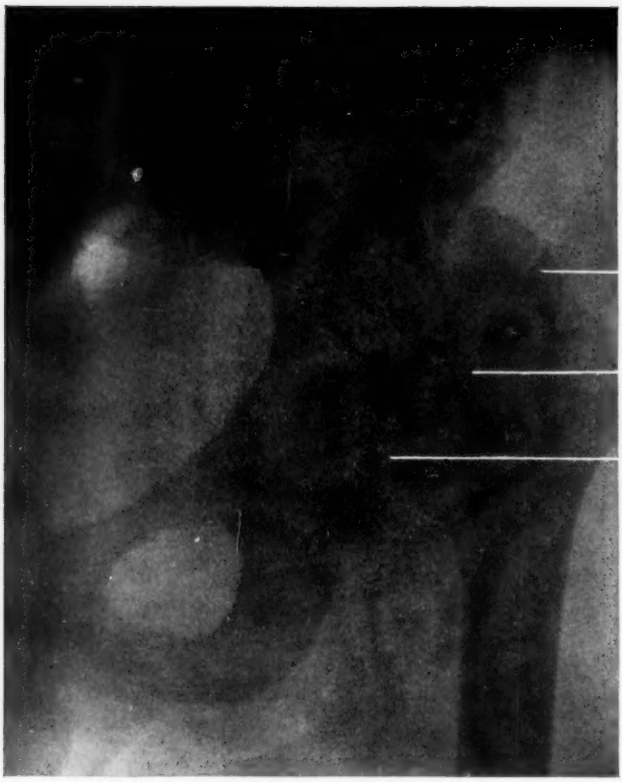
When admitted to hospital the right leg was everted, being painful and tender over its whole extent and helpless as to voluntary motion or usefulness. The woman could not stand or walk and had been in bed for several months. There was slight pitting on pressure. Sensation was preserved. The right leg was somewhat smaller than the left in circumference, and is described in the hospital notes as being shorter than the left.

Some time after her admission an X-ray plate was obtained and the report made that the skiagraph was negative as to patho-

FIG. 1.

Ankylosis from arthritis of right hip before manipulations caused dislocation. (Reversal of plate makes this appear to be left hip.)

FIG. 2.

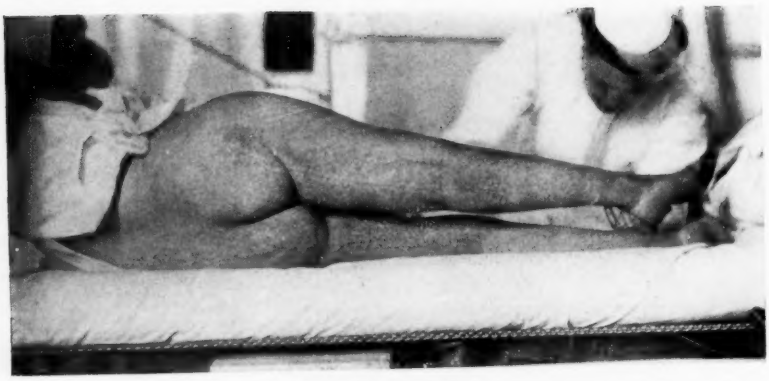


Everted dorsal (supracotyloid) dislocation of right hip. (Reversal of plate makes this appear to be left hip.)

FIG. 3.

Everted dorsal (supracotyloid) dislocation of right hip.

FIG. 4.



Everted dorsal (supracotyloid) dislocation of right hip. (Photograph taken with patient lying on bed, because of her nervousness after the anterior view was taken by photographer.)

FIG. 5.

Posterior view after operation of excision of head of femur for everted dorsal (supracotyloid) dislocation of right hip. About three weeks after operation.

FIG. 6.

Showing ability to flex hip in sitting posture after excision of head of femur for everted dorsal (supracotyloid) dislocation of right hip. Taken about three weeks after operation. Knee is still somewhat stiff because of long previous retention of patient in bed, previous to the dislocation.

logical findings. Two weeks before I saw her the attending surgeon had the patient etherized and made passive movements of the hip. The thigh was flexed at a right angle and the limb then abducted and adducted to break up adhesions at the joint. The head of the bone moved under these manipulations. It gave the operator the impression that it became luxated and was replaced, and would not remain in the socket. I understood that he thought it possible that there had been originally a fracture of the rim of the acetabulum, because that cavity seemed to permit the femoral head to slip out and in very readily. After these manipulations the leg measured in length about two inches less than the left limb. The patient was returned to bed and continuous traction with weights applied.

After making the diagnosis of probable old fracture of the neck of the femur, I renewed my efforts to obtain a personal view of a skiagraph taken before she came under my care and to have several skiagraphs taken in the laboratory of the hospital.

After a series of delays both objects were attained. The lesion was instantly clear. The first skiagraph showed the existence of an arthritis of the hip-joint, which had not been reported to the surgeon in charge, though the adhesions found under anæsthesia had revealed such a condition to him. The second skiagraph, which was made after I had been given charge of the woman, revealed a posterior dislocation of the head of the femur, with eversion of the limb. The head of the femur was seen lying against the ilium, higher than the acetabulum and a little behind it.

In other words, the patient had had a coxitis in January, 1910, followed by articular ankylosis. This had been the cause of her pain, her unwillingness to move, and her nervous perturbation. The manipulations made by my predecessor had ruptured the adhesions, and then a reversed or everted dorsal dislocation had occurred. A more intimate knowledge of the previous history of the patient, obtained during her stay in the hospital, disclosed the fact that there had existed a vaginal discharge just previous to the attack of so-called rheumatism of the hip. Whether the arthritis of the hip was traumatic or infectious is unknown.

In order to reach an operative conclusion, which would give the patient the best use of the injured limb, I called into con-

sultation Dr. James H. Hutchinson, Dr. J. Torrance Rugh, a surgeon and the orthopædist respectively of the hospital, and Dr. Oscar H. Allis, who has made such a valuable study of dislocations of the hip.

The question submitted was whether attempts should be made to reduce the luxation rather than excise at once the head of the femur and thus establish a movable hip-joint.

The acetabulum after the lapse of about five weeks was presumably well clogged with remains of capsule and with inflammatory exudate. It was known to have been an abnormal joint before the luxation took place. The attempts at reducing the displacement by my predecessor were apparently successful, but he was unable to keep the head in the socket, and suspected that the acetabular rim had been broken off. If a stiff hip occurred after a successful replacement, the patient would lose either the ability to flex the hip, as in sitting, or the power to straighten it, as in standing. The joint would be fixed in a position favorable for only one posture, and the patient would be unable to assume the other. My own feeling at first was that reduction should be attempted; but after hearing the opinion of my associates, and considering the history, I decided that it would be wiser to excise the head of the femur and establish a movable joint.

On November 29, 1910, therefore, I made a long incision behind the great trochanter and found the head lying on the ilium considerably above and a short distance behind the acetabulum. It rested in a socket-like depression caused by the normal concavity of the bone at that site being deepened by inflammatory thickening of the surrounding soft tissues. The acetabulum was readily identified. It was situated about 1½ inches below and a little in front of the resting place of the femoral head. It was filled with soft structures through which the socket could be felt with the finger-tip. The head of the femur was removed by dividing the neck close to it and the wound closed with sutures, after a drainage tube had been introduced. A gypsum encasement including the pelvis, hip, and thigh was applied, with the limb extended and slightly everted. Traction on the leg was made by Buck's method with about twenty pounds attached to the stirrup. An opening was left in the gypsum splint for dressing the wound.

The drainage tube was removed early, the canal left by its

withdrawal loosely packed with gauze, and the encasement removed permanently in less than three weeks. Massage and passive motions of the knee and hip were ordered on the twenty-second day; the patient got out of bed on the twenty-fourth day, and was directed to sit up in a chair, and gradually increase the flexion of the hip.

She continued to be very much afraid to use the limb or try to walk, and said that she had not been out of bed for a year; but at the end of a month she was walking a little on crutches, and the knee, though still stiff from long disuse, was gaining normal mobility under manipulation. The wound had healed promptly except that a sinus existed at the point where the drainage tube was employed. Flexion and rotation of the hip were quite good.

She was ordered to wear a shoe with a high heel and sole, and as rapidly as possible to dispense with crutches or cane. She was unwilling to obtain the shoe before leaving the hospital. Since she went home I have not seen her. A letter recently received shows that she has not obeyed orders in regard to using the limb actively. I, therefore, fear that she will not obtain as satisfactory a hip-joint as she otherwise would.

This case is reported because of the infrequency of reversed or everted dorsal dislocations of the femur, and because my ignorance of the condition led me to believe at first that I had an old fracture of the neck of the bone before me. It is a good illustration also of the value of X-ray pictures. These should always be studied by the surgeon himself, with, however, the aid of an experienced radiologist. I find it of the greatest importance to see and study the plates myself. Errors are likely to be made if the surgeon merely reads the report of the person who made the skiagraphic picture.

In the instance before us the verbal report made to me by the resident surgeon of the hospital was that the first skiagraph showed a normal joint. This was found to be an erroneous statement, because inspection of the plate revealed arthritic changes. I have long regretted that I am not a skilled microscopist and a practical radiologist, in order to more properly gauge the value of my clinical diagnoses.

In 1892 Dr. L. A. Stimson reported to this association an interesting case of upward luxation of the hip which this case of mine resembles; and in the Transactions of 1900 is given the account of Dr. Oscar H. Allis's valuable demonstrations of dislocations of the hip, made before the Fellows at the meeting of that year. Ridlon has reported a supracotyloid dislocation, and adds a valuable bibliography. He gives what I think is a valuable hint. It is that the steady pelvis, necessary when reducing luxations of the hip, may be obtained by flexing the uninjured thigh strongly against the trunk of the patient and strapping it there. The operator's assistants then have a grasp and a leverage by which the pelvis can be held practically immovable during such manipulations as may be required without fastening the patient to the floor with apparatus.

It is now believed generally, I think, that leverage during flexion of the hip is the usual mechanism of luxations of the head of the femur. The femoral head probably escapes always downward by bursting the joint capsule, by means of pressure against its internal surface. Displacements then occur in various directions from the continuance of the accidental forces or as a result of incidental forces. The head of the bone may finally come to rest at any point around the socket. The capsule may be torn from the edge of the acetabulum, from the upper end of the femur, or between these two points. There are two usual positions on the anterior plane of the pelvis and two on the posterior plane, which have received the names thyroid and pubic, and iliac and sciatic respectively. Greater laceration of the capsule, especially of its iliofemoral reinforcement, termed the inverted Y ligament, permits wider excursion of the head under displacing factors. As a consequence various modifications of the posterior and anterior dislocations may occur. Their names are numerous, but the necessity of specific nomenclature is not very apparent.

The capsule is not infrequently crowded into the acetabulum by the advancing head of the femur during attempts at reduction. This is most likely to occur when the course of

the head in its exit from the socket is not retraced by it, when the surgeon essays replacement.

The reversed dorsal luxation, seen in these photographs and skiagraphs, is simply a modification of the ordinary high dorsal displacement permitted, it is believed, by inclusion of the external limb of the iliofemoral ligament in the capsular rupture. It is said by Koenig to occur in breaking away of the posterior wall of the acetabulum. It is more or less equivalent to the so-called " supracotyloid " or " subspinous " form. It is not unlikely that " supraspinous " is employed for a modification of the same form of displacement, for it is described as having the head resting on the ilium much in advance of its usual luxated position and lying above the anterior inferior spinous process or even in front of it, so that the neck of the bone rests against the notch between the anterior superior and anterior inferior process.

In the ordinary dorsal luxation, usually termed the iliac dislocation, the head of the thigh bone lies much behind and above the socket. Because of the tension of the untorn outer branch of the iliofemoral ligament, the limb is inverted. The hip-joint is flexed. When the external limb of the ligament is torn, however, the head of the bone is free to move forward under appropriate forces. Then it approaches the region above the acetabulum and the anterior inferior spine of the ilium, and becomes a reversed or everted dorsal, a supracotyloid or a subspinous. Perhaps the so-called " supraspinous " may be a mere variation.

In reviewing this case I have criticized myself for not removing the whole length of the neck of the femur when I excised the head. I have wondered whether a better use of the limb would have been obtainable by scooping the soft tissues out of the socket, turning in a flap of fascia, and then reducing the luxated head instead of excising it.

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THE TREATMENT OF OBLIQUE FRACTURES OF THE TIBIA AND OTHER BONES BY MEANS OF EXTERNAL CLAMPS INSERTED THROUGH SMALL OPENINGS IN THE SKIN.*

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OF DENVER, COLORADO,

Professor of Surgery in the Medical Department of the University of Colorado.

MANY unsatisfactory results are obtained in oblique fractures of the tibia. As soon as the injured muscles regain their contractility, the fragments frequently begin to slide by each other with exasperating persistency, in spite of the most ingenious splints; and all efforts to prevent shortening and deformity are too often futile after secondary contractures of the tissues occur. Even when the functional result is sufficiently good, the surgeon is still in legal danger, as I have seen in several instances, because a radiograph obtained by the patient can show such poor coaptation that a suit for damages may be instigated.

The methods usually employed in the treatment of these oblique fractures are:

1. *Splints or plaster casts.* These are often powerless to hold the fragments in place without undue tightness or injurious and painful pressure upon the bony prominences of knee or ankle. In addition, they do not exert traction; and without this there can be no certainty that the fragments are held in alignment, owing to the thickness of the tissues, which is usually increased by swelling.

2. *Extension.* In this situation extension is difficult to apply in sufficient amount without discomfort to the patient. Even sloughing of the skin, injurious stretching of the ligaments of the knee, or damage to the nerves or vessels may

* Read before the American Surgical Association, June 19, 1911

result, to say nothing of the irksomeness of having to lie continuously in one position for several weeks.[1]

3. *Open operation.* The difficulty can undoubtedly be remedied in this way, but at the expense of some risk. Such procedures usually mean a large wound together with considerable manipulation of the tissues and stripping up of the periosteum. Hemorrhage is at times hard to control, and fragments may have to be removed which could otherwise be left in place. All this gives rise to two dangers—infection and delayed or non-union.

The chance of infection is perhaps not great with a competent surgeon and favorable surroundings; but in the hands of inexperienced operators, under whose care fractures most often fall, the danger is considerable.

The tibia is one of the most frequent sites of delayed or non-union, and particularly is this true of fractures which have been operated upon and perhaps united by wires or bone plates. Fritz König asserts that this is due to the removal of blood-clots and tissue fragments, which are supposed to stimulate bony union, while others place the blame upon the foreign bodies introduced by the surgeon; but whatever the explanation may be, the fact remains.

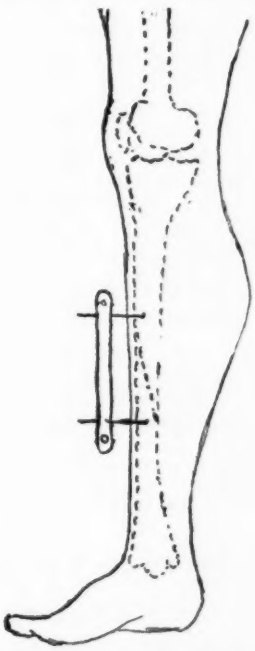
In addition, even if there were no real objections to an extensive open operation, there would still remain many patients who would refuse to have it done and numbers of physicians whose experience and prejudices would not permit them to do it.

Hence it is desirable that there should be some easy and effective method of handling these oblique tibial fractures, which is not open to the criticisms mentioned above. With this idea in view, it occurred to me that all the requirements could be met, in many instances, by inserting a screw with a long projecting end through a small hole in the skin into the upper fragment, well above the fracture, and another into the

[1] Steinmann has recently applied his "nail-extension" to this form of fracture, which is, perhaps, an improvement over older procedures, although inferior, I believe, to the method to be described.

lower fragment; then reducing the fracture by manual extension and fastening the screws together by a firm external clamp (Fig. 1 and Fig. 2, *a*, *b*). After testing the method, I made brief mention of it in a discussion on the operative treatment of fractures in the Surgical Section of the American Medical Association, June, 1908.

FIG. 1.



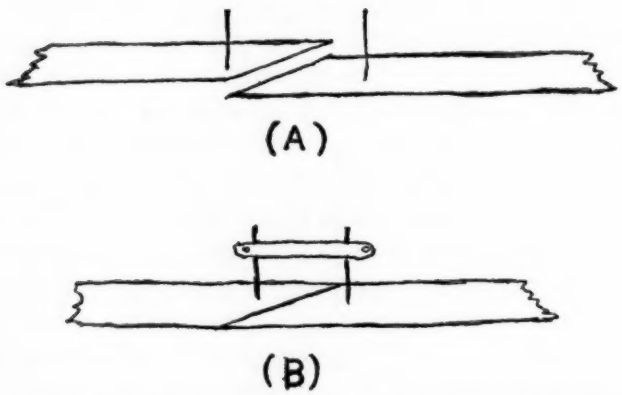
External clamp in position in oblique fracture of the tibia.

Operative Technic.—The shape of the fragments and their relation to each other are determined by manipulation and especially by the use of the X-ray. Under general anæsthesia two small incisions, each about one-fourth of an inch in length, are made through the skin and fascia over the flat anterior surface of the tibia, one below and one above the fracture. They should be situated well away from the break,—if possible, in sound, unlacerated tissues.

Through these incisions, holes must now be bored in the

bone for the reception of the screws. This, of course, can easily be done with ordinary drills; but unless some special apparatus is employed, such as I shall describe, the soft parts will close over and conceal the openings in the bone as soon as the drill is removed, thus preventing the insertion of the screw. Every surgeon who has done much bone work has doubtless been annoyed by similar occurrences. To prevent this I employ a small steel tube (Fig. 3, *a*) about the size of a lead pencil, having several sharp teeth at one end, which may be driven into the bone by a tap with some heavy instru-

FIG. 2.



(A), screws in place before reduction of fracture; (B), fracture reduced and screws clamped.

ment. An obturator (Fig. 3, *b*) guards the teeth and facilitates the forcing of the tube through the tissues by means of its pointed extremity.

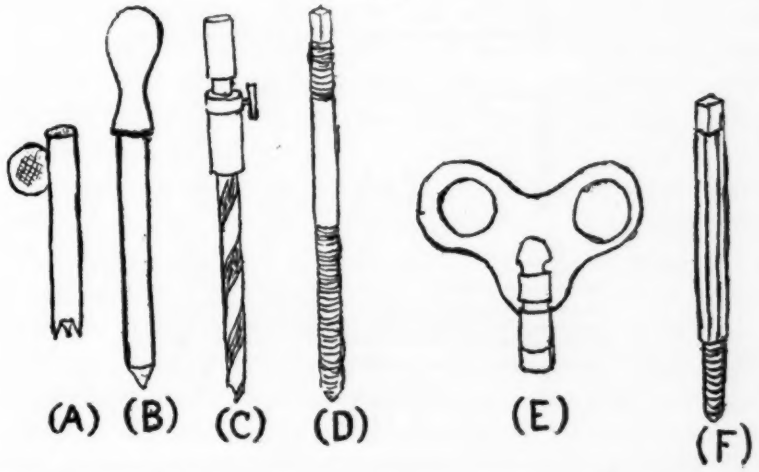
When the tube is set firmly against the bone, an assistant holds it in place by grasping with a pair of forceps the lateral projection provided for the purpose. The obturator is then removed, and a drill inserted in its place, which is fashioned with an adjustable shoulder to fit the tube (Fig. 3, *c*), in order to centralize the hole in the bone and facilitate the entrance of the screw.

The hole must be deep enough to permit the screw to hold firmly, and its lower end should be slightly inclined away from

the fracture in order to give a secure purchase to the clamp against the contraction of the tissues. It should extend through the cortex, at least, and sometimes even through the medullary cavity into the cortex of the opposite side, especially when the osseous structure is unusually soft.

When the drill is removed, a screw which fits the tube (Fig. 3, *d*) is easily inserted and the tube withdrawn. The screw should be long enough to project some two inches above the

FIG. 3.



Instruments required for applying clamp-screws. A, canula; B, trocar; C, drill; D and F, screws; E, key to manipulate screws.

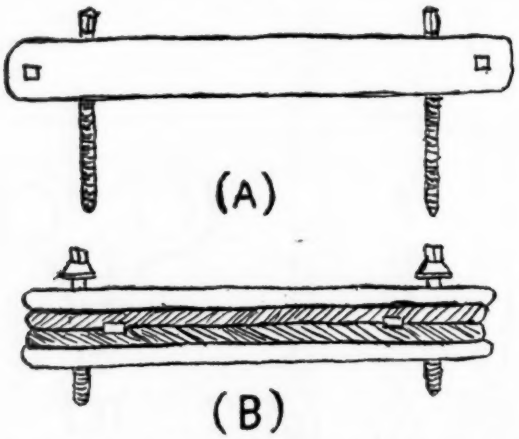
skin after it is driven home. *It must be slightly larger than the drill hole,* to insure solidity, and somewhat pointed at its extremity, so as to enter easily. Its outer end is squared to fit an ordinary clock-key (Fig. 3, *e*), by means of which it is manipulated. The threads are continued up to this squared extremity, thus giving a better grip to the clamp.

The question might here be raised, why the drills could not be left in place instead of taking the trouble to remove them and insert screws? But this is not practicable, because the drills are smooth and smaller than the holes and hence would be lacking in firmness. Practically the same thing can be said,

of nails, which, in addition, as they are driven into the fragments may split them and ruin the chances of success.

Forcible manual extension is now applied to the leg until the fragments are brought into position, when the projecting screws are clamped together (Fig. 2, *a* and *b*), thus preventing recurrence of the deformity. The clamp used for this purpose is made of two long, firm strips of steel, held together at their ends by screws, which can be tightened and loosened with a

FIG. 4.



Side and top views of clamp, showing, in (B), the wood lining between the steel side strips.

clock-key (Fig. 3, *e*). A most important feature is that these metal side pieces are lined with soft pine wood, into which the threads of the screws bite as firmly as if the screws were driven through a solid block, thus preventing the possibility of their easily working loose (Fig. 4, *a* and *b*). A dressing is now applied, using thick pads of sterile gauze around the clamp, and the leg is securely but not too tightly splinted.

It will, of course, be understood that the sole object of the clamp is to prevent the ends of the bones from sliding past each other, which is the main difficulty in oblique fractures, and the one hardest to overcome. Angular deformity and lateral separation of the fragments must be controlled by splints, which should be carefully adjusted to the sides of the

limb as well as posteriorly. The use of splints could undoubtedly be rendered less necessary by placing two screws in line in each fragment, as is done in open operations with external clamps, but I am convinced that this is usually unnecessary and merely complicates the procedure.[2]

It is evident that the method just described is not applicable to all cases of oblique fracture of the tibia, but only to those sufficiently near the centre of the shaft to leave room enough on either side for the firm insertion of the screws. It is also not indicated where other and simpler methods will suffice or when the fracture is too old to permit of reduction of the fragments. Its usefulness might also be questioned in compound fractures with openings already so large that wiring could easily be done.

The statement is frequently made that external bone clamps are apt to lead to serious infection. I am convinced that this is not true, not only from my own experience, but from that of Parkhill and many others, and I wish to emphasize the following statement: *If the operation is a clean one, serious infection will not occur. On the other hand, if the operation is not clean, suppuration will take place with any method, but the results will be less serious in the presence of the drainage afforded by the screws of an external clamp; and, furthermore, in case of infection these screws can much more easily be removed than can buried plates, ferrules, or wires—with far less inconvenience to the patient and without the use of an anæsthetic.* To this may be added, that properly applied

[2] The external fixation of bones by means of long screws and clamps was first introduced, as far as I am aware, by Keetley, of London. Since then many different clamps have been devised, including that of Clayton Parkhill, who did more to popularize the method than any other surgeon. Parkhill's clamp, and others which have appeared abroad, are unnecessarily complicated and difficult of application, owing to the various wings, nuts, and adjustments with which they are hampered. The apparatus described above is free from these objections and is so simple that it can always rapidly and easily be inserted. I first described it in the ANNALS OF SURGERY, vol. ii, p. 561, 1904.

The various forms of these clamps may be obtained from W. H. Lauth, Metropolitan Building, Denver, Col.

external clamps hold the bones more firmly than do wires or even ferrules or bone plates, and that when they are removed the danger of future complications is done away with completely.

It is, of course, always possible that slight infection may ultimately occur from the screws, although much can be done to avoid this by the occasional application of tincture of iodine to the surrounding skin; but if this should take place, it is of slight importance and does not spread, because the screws, like silkworm sutures, soon become walled off by a resisting cylinder of granulations, as do the nails in Steinmann's method of direct extension. And it should also be clearly understood that the danger of infection is especially slight in the procedure under consideration, in which the screws are inserted at a distance from the fracture, perhaps in normal tissues, through small openings in the skin.

It might be thought that such a large external clamp would cause discomfort; but it must be remembered that the greater part of the clamp *is* external, and that the portion within the tissues is limited to two moderate-sized screws, which are but little more bulky than a length of heavy wire and much less so than plates or ferrules. And, in addition, experience has taught me that no suffering is experienced by the patient, as is also the case in Steinmann's method of treatment of fractures of the femur, in which heavy weights are suspended from nails driven into the femoral condyles.

The method I have described need not be confined to injuries of the tibia, but may be employed with slight modifications to appropriate fractures of other bones, which are not too deeply situated and which possess sufficient stability to permit of the firm insertion of screws—such as the clavicle, the patella, the upper part of the ulna, the lower jaw, and, under some circumstances, the humerus and even the femur.

It is well known that certain oblique fractures of the clavicle and of the inferior maxilla are extremely hard to hold in position, while open operations for their relief are objectionable, for cosmetic and other reasons. Many more

or less ineffective forms of apparatus have been suggested in their treatment, which, especially in the case of the jaw, often give rise to considerable discomfort, not to say suffering. There is no reason why these injuries cannot be effectually and comfortably handled by an external clamp inserted through such small openings in the skin that but trivial scars will result, it being only necessary to prevent the fragments from sliding past each other in order to achieve success, as I have demonstrated in connection with the jaw. The drills for this purpose, however, must be provided with an adjustable shoulder and the screws with a permanent shoulder (Fig. 3, *c* and *f*) in order to prevent accidental perforation of the bone and injury to the subjacent structures. The tube through which the drill is inserted will prevent lateral slipping of that instrument. The clamps should also be small and made of some light material, such as aluminum, especially where the inferior maxilla is concerned.

It may also be suggested that screws are preferable to nails in applying extension from the condyles in fractures of the femur, because they retain a firmer seat in the bone and are not so apt to become rapidly loose. It is evident that they may easily be inserted by the method under discussion.

ACUTE PNEUMOCOCCUS INFECTIONS OF THE EXTREMITIES.*

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THAT the *Pneumococcus arthrites* are fairly common seems apparent from the perusal of an interesting paper by Nitch (*British Medical Journal,* September 21, 1907), who says: "After a fairly extensive search through literature I have found records of ninety-eight cases (one hundred cases including two of my own) of arthritis, in which the presence of the pneumococcus was definitely proved by bacteriological examination." Mauclaire (*Nouveau Traité de Chirurgie,* Le Dentu et Delbet, Paris, 1909, volume vii) says: "*Pneumococcus pyarthroses* are beginning to attract considerable attention. Traumatism preceding chronic arthritis predisposes to the localization of the pneumococcic infection. The pus is thick, creamy, tenacious, greenish-yellow. From the symptomatic point of view there is at first a very acute stage, with œdema and considerably dilated subcutaneous veins. The pain is moderate, the symptoms tend to improve; the condition may become chronic."

The writer is able to ascertain but two instances in which the pneumococcus in pure culture [1] has been recovered from inflammatory affections of the soft parts of the extremities.

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* Read before the American Surgical Association, June 19, 1911.

[1] The literature on this subject is very meagre. W. Hagen (Ueber akute chirurgische Infekt. Krankheiten., Würzburger Abhdlg. a. d. Gesammt. geb. d. Prakt. Med., x, 1910) says that the pneumococcus or *Diplococcus lanceolatus* is closely related to the streptococci, and that it may cause a series of pathological processes of the most variegated character, in addition to pneumonia. Secondary inflammations in any tissue or tissues may develop as a sequel of pneumonia through metastasis, but these inflammations may also occur primarily, as the pneumococci are able to enter the organism in other ways than by way of the lungs. They have been found in the accessory sinuses of the nose, the tympanic cavity of the ear, etc. Their cultural behavior resembles that of streptococci, from which they are sometimes distinguished with difficulty.

The first of these is reported by SABATIER (Contribution a l'étude des localizations extrapulmonaries primitives du pneumocoque, *Archiv. Gén. de Médécine*, No. 30, 1906). It concerns the case of a young soldier, who was kicked by a horse in the middle third of the antero-external region of the left leg. No bone was broken. The condition seemed to be that of a simple contusion. Four and a half months later a phlegmonous inflammation of the leg developed. An abscess was incised, and a thick, dark greenish pus evacuated. The centre of the purulent focus seemed to lie in the subcutaneous cellular tissue between the skin and the muscular aponeurosis. Examination of the pus showed the presence, in large quantities, of the *Pneumococcus lanceolatus*. Slow healing.

The second observation was made by T. ARNOLD JOHNSTON (A Case of Pneumococcal Infection, *British Medical Journal*, October 12, 1907). He pricked the third finger of his left hand while resecting a child's rib for pneumococcal empyema. There was an inflammation of the cellular tissue of the finger and hand, the condition being ushered in by a chill and vomiting. There was a continuous high fever for several days, crisis on the fifth day, with profuse perspiration and immediate cessation of all grave symptoms. Various incisions were made, but no pus was found. The serum from the wounds contained pneumococci in pure culture. Johnston says: "The course of the disease bore a remarkable resemblance to the typical course of croupous pneumonia, and is perhaps suggestive of a different line of treatment for similar general infections, abandoning surgical procedures.[1] The incisions certainly relieved tension by bleeding freely, but no pus formed, and the resulting cicatrization has produced considerable stiffness and tenderness which is yielding slowly to massage. In a similar case I should be inclined to examine the serum for pneumococci, and, if this were found, treat the case as an ordinary pneumonia,[1] giving morphine in small doses for the pain."

In close connection with this case of Johnston's the writer would cite the following personal observation:

CASE I.—Mr. X., a machinist, twenty-six years of age, injured the last phalanx of his left thumb on March 29, 1911, sustaining a contused and lacerated wound of moderate extent. He was immediately accorded suitable aseptic care. Infection slowly developed, spreading up the forearm and arm in the form of a superficial lymphangitis. Through the courtesy of Dr. L. T. Durbin he was seen by the writer on April 6. At this time the thumb was suppurating moderately, the hand was somewhat swollen, there was a superficial lymphangitis on the anterior aspect of the forearm and arm. There was a tender mass the size

[1] The writer is unable to agree with this suggestion.

of a small apple in the axilla. The pulse was 80 to the minute, the temperature 100.6°. The patient did not complain of feeling definitely ill. The moist boric compresses which had been instituted by the attending physician were continued. Eighteen hours later the patient had a severe chill, the pulse went to 108 to the minute, the temperature to 102°. When the limb was examined it was found that the inflammatory process had extended to the deeper tissues, the whole extremity being much swollen and reddened, painful and tender. The patient felt correspondingly ill and depressed. The entire picture was that of a rapidly extending septic infection.

Operation under ether, April 7. Multiple free incisions through the deep fascia from the thumb and hand to the shoulder. No pus found. The tissues were boggy and œdematous. Cultures taken from the deep tissues of the arm just below the shoulder were submitted to Dr. E. C. Hill for examination. Dr. Hill reported, after very careful examination, that he found pure cultures of pneumococcus.

After the incisions were made the process rapidly subsided. The following day the temperature was 99.4°, the pulse 90. The axillary enlargement rapidly disappeared. The wounds made in the forearm and arm healed without suppuration, the thumb suppurating moderately. Cultures taken April 12 showed pneumococcus and staphylococcus, the latter doubtless due to accidental infection. The case went on to a relatively early recovery.

While this process resembled a streptococcic one, it seemed to the writer less virulent than one observes in the ordinary diffuse streptococcic infections, and it subsided rather more rapidly than does a streptococcic process of similar extent.

A second observation concerned a young gentleman serving at the time as a surgical interne at St. Joseph's Hospital in Denver. In February, 1911, he developed a small furuncle at the back of the left hand, apparently originating in a hair follicle. The hand became moderately swollen and was tender. Incision revealed a little pus and from this the pneumococcus in pure culture was recovered. Three or four other small furuncles followed, each showing the pneumococcus. Clinically the process did not seem to differ materially from that seen in an ordinary staphylococcus furunculosis.

DISLOCATION OF THE HIP COMPLICATED WITH FRACTURE OF THE FEMUR.

REPORT OF TWO CASES.

BY GEORGE H. MONKS, M.D.,

OF BOSTON, MASS.,

Surgeon to the Boston City Hospital.

IF one may judge from the few cases of dislocation of the hip with fracture of the femur that are reported, it is fair to assume that this combination of injuries is a very rare one. It is for this reason that I venture to place on record the two cases referred to in the title of this paper. These cases were admitted to my service at the Boston City Hospital; one at the main hospital, and the other at the relief station in Haymarket Square. Both of them I personally examined and treated.

I will give all the facts I have been able to get in regard to these cases, but, unfortunately, in neither of them is the information gained very full or exact.

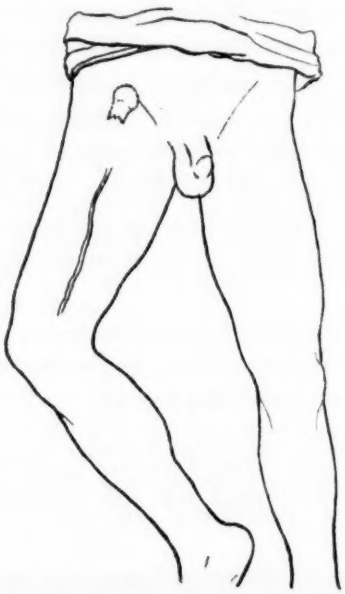
CASE I.—*Anterior dislocation ("pubic") of the head of the right femur, complicated with fracture through the neck of the bone; other injuries; reduction of dislocation; death a few hours later.*

W. F. C., a man of sixty-four years, was run into by an electric car, Feb. 24, 1909, receiving a number of severe injuries, from the effects of which he died about seven hours later. Immediately after the accident he was brought to the hospital, and there carefully examined by the house surgeon, who forthwith notified me. I went to the hospital at once, and made an examination as thorough as the conditions allowed. The man was in a state of shock so severe as to suggest the presence of internal injuries and to admit of little prospect of his recovery. There was a fracture of the right clavicle, and also of the fourth, fifth, and sixth ribs, over the region of the heart. Besides this, there had evidently been much damage done in the neighborhood of the right hip.

Upon examination of the hip and the region about it, the

following conditions were apparent: There was a *fracture* through the neck of the femur, and the head of the bone was *dislocated anteriorly,* lying at a point near the middle of Poupart's ligament. The head lay in such a position that its fractured surface faced downward and slightly forward. Across this jagged bony surface lay the femoral artery, which beat freely. The superficial veins of the entire leg were enlarged and very prom-

FIG. 1.



Sketch showing the relative position of the two legs in Case I, as the patient lay upon the floor. Anterior dislocation ("pubic") of the head of the right femur, complicated with fracture through the neck and with pressure upon the femoral vessels. The position of the displaced head of the bone and of the enlarged and prominent internal saphenous vein is roughly indicated in the sketch.

inent—a condition which suggested probable obstruction to the femoral vein. The leg was everted, and the knee slightly bent. Fig. 1, being a copy of a sketch I made at the time—as the patient lay upon the floor before he was etherized—gives a general idea of the position of the leg and of the detached head of the bone.

Realizing that the fractured end of the femoral neck would, if allowed to remain in this position, ultimately open up the vein or the artery (if it had not already done so), I decided to make the attempt at once to reduce the dislocation, and, in the

event that I should fail, to cut down upon the dislocated head. Ether was given, and then, in accordance with the advice given by Allis, steady traction was made on the limb by an assistant, while I attempted to manipulate the head of the bone back into the joint. This I succeeded in doing, but only after a prolonged trial, during which the leg was placed in a variety of positions.

Remarks.—Judging from palpation of the dislocated head, and also from the fact that it lay in its displaced position far from the end of the bone to which it belonged, I am inclined to think that the fracture was an intracapsular one, and that the head had entirely broken away from all vascular connection with the tissues.

The fatal termination of this case a few hours later made me think that, possibly, I ought to have waited for the patient to recover from his first shock before undertaking reduction of the dislocated fragment or its resection; but, as I now think over the case, I believe that I was right in doing as I did, for the reason that the danger of perforation of the femoral artery or vein was imminent. Unfortunately, no autopsy was made in this case, and therefore the existence of severe internal injury, which the symptoms suggested, could not be proved.

CASE II.—*Anterior dislocation ("low thyroid?") of the head of the femur; reduction; fracture of great trochanter and of the acetabulum (?) discovered during convalescence by Röntgen examination.*

J. J. K., hoisting engineer, sixty years old, was brought to the relief station in Haymarket Square, March 29, 1911.

The patient stated that he was struck by an electric car, and that, having fallen under the fender, he was pushed along for a short distance, during which time he thinks he was lying on his right side. He could give no further particulars.

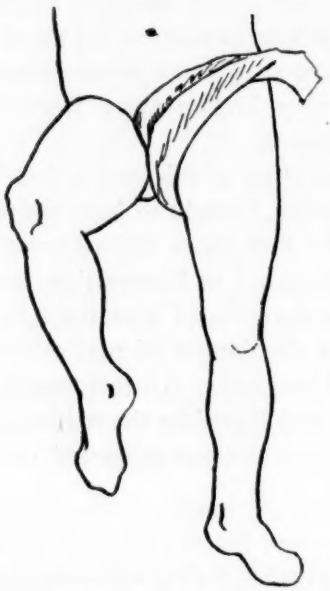
The man was powerfully developed and rather stout. There was an alcoholic odor to his breath, his speech was thick, and his cerebration slow. There were numerous abrasions over his right arm and right leg.

As it was evident that the case was one of dislocation of the hip, the man was laid upon the floor and profoundly etherized

before a thorough examination was made. As he lay there I made a rough sketch of his legs, showing their relative position. Of this sketch Fig. 2 is a copy.

The right thigh was flexed at an angle of about 45° and somewhat abducted. The foot was strongly everted, and its outer border rested on the floor. The region corresponding to Scarpa's triangle, at the inner aspect of the upper part of the thigh, was

FIG. 2.



Sketch showing the relative position of the two legs in Case II, as the patient lay upon the floor. Anterior dislocation ("low thyroid") of the head of the right femur complicated with fracture.

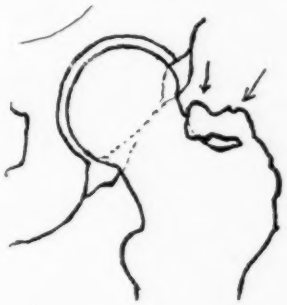
bulging, and, near the middle of Poupart's ligament, could be felt on palpation a rounded mass which was evidently the head of the femur. In the region, where ordinarily the great trochanter can be felt, there was a deep sulcus. By rectal palpation could be felt a smooth rounded body—evidently the head of the femur—which, when the thigh was flexed and rotated, could be felt to move. Apparently the head lay in front of the thyroid foramen.

On first attempting to reduce this dislocation by the Bigelow method (external circumduction, flexion, and vertical trac-

FIG. 3.

Showing a print (with key) of the Röntgen plate of the right hip (seen from behind) in Case II. The two small fragments of bone refeared to in the text are to be seen (indicated by arrows in the key) just above the neck of the femur. Careful examination also reveals what may be gaps in the great trochanter and in the brim of the acetabulum.

KEY TO FIG. 3.



tion) the head of the bone slipped past the rent in the capsule, and slid into a pocket on the dorsum ilii. I made careful inquiry as to whether the head of the femur was originally dislocated upon the dorsum, and whether it had been carried forward into an anterior position by efforts to reduce it; but I received positive assurance that the dislocation was the same when I saw it as it was when the man was brought to the hospital.

I made further efforts to reduce the dislocation, but I succeeded only in transforming a posterior dislocation into an anterior one again, and then an anterior into a posterior, and so on for several times. Finally, after causing the head of the bone to be brought to the position where I thought the rent in the capsule should be, and pressing on the great trochanter, I succeeded in reducing the dislocation without difficulty.

Pads were placed between the patient's knees and also between his ankles, and the two legs at these points were loosely bandaged together.

The man was later transferred to the main hospital, and a Röntgen examination of the region of the injured hip was kindly made by Dr. A. W. George (see Fig. 3).

The Röntgen plate showed two small, more or less detached fragments of bone, just above the neck of the femur. Where these fragments came from is not at all clear, although the plate indicates that they were originally a part either of the great trochanter or of the brim of the acetabulum, or of both of these structures. This element of fracture introduced into the case a complication, which up to that time had not even been suspected.

The man left the hospital about the middle of May, his improvement to that date being entirely satisfactory.

Remarks.—This case was peculiar in the dislocation as well as in the fracture. That the head was dislocated anteriorly was evident from the fact that not only could it be felt in the region of the groin but also by rectal palpation. If further proof were needed it might be found in the eversion of the foot, the absence of the trochanter from its usual position, etc. In fact, these signs rather go to prove that this dislocation (unless, on account of the fracture complications, it belongs to the irregular class) is an example of dislocation of the hip of the "low thyroid" variety (Allis).

The marked flexion of the thigh in this case strongly suggests a downward dislocation ("luxatio subcotyloidea" of Malgaigne)—in fact, there was much resemblance between the position of my patient's limb as he lay upon the floor and that of the figure in Dr. Bigelow's monograph illustrating this so-called "downward dislocation." But such a dislocation would obviously be impossible in a case in which the head of the femur could be felt in the groin, and which presented the other signs already enumerated.

I am not aware, however, that this marked flexion of the thigh is a characteristic sign of thyroid dislocation, and I think it possible, therefore, that it may have been caused, partly at least, by the great trochanter being caught below the acetabulum.

The ease with which the head dropped into a position on the dorsum ilii during my first manipulations (for I was not using great force at the time) inclines me strongly to the view that the original dislocation was probably a posterior one, which was later changed to anterior. If such were the case, and, assuming that the shifting of the head of the bone was not due to intentional manipulation, I think it possible that it may have been caused by unskilful handling at the time when the man was picked up and brought to the hospital. [1]

The difficulty experienced in reducing this dislocation was due partly to the fact that the man's leg was large and heavy, and therefore difficult to manipulate properly, and also to the ease, already referred to, with which the head of the bone could be displaced from an anterior into a posterior position, and *vice versa*. It is quite possible that the existence of the fracture through the tip of the great trochanter, the existence of which however I did not suspect at the time of the reduction, may have increased the difficulty still further.

I have been able to find in the literature only a few cases of hip dislocation complicated with fracture of the femur.

[1] For a somewhat similar case, see article by G. Fischer entitled "Umhandlung einer Luxatio pubica in eine Luxatio ischiadica," Deutsche Zeitschr. für Chirurgie, 1890–91, xxxi, p. 438.

These cases differed considerably as to the variety of the dislocation, and also as to the site of the fracture. In some of them the dislocation was of the posterior variety, and in others of the anterior. The fracture in the large majority of the cases was either through the shaft of the bone or through its neck.

Of those cases where the fracture was *through the neck of the bone* the fracture usually resulted from attempts to reduce the dislocation. In only a few of them did the fracture occur at the same time as the dislocation.

Referring to cases of dislocation combined with fracture of the neck, Stimson,[2] who analyzed 14 cases collected by Wippermann and also those referred to by Hamilton, writes: "The only cases of which I have knowledge in which the neck appears certainly to have been broken at the moment of dislocation are one reported by Tunnecliff and one by Post, in which both hips were dislocated, and one by Lossen, and even in the latter the patient was not seen by the reporter until six weeks after the accident . . . ."

The case reported by Douglass, however (No. 2 in Wippermann's list, but with the wrong reference) bears such a striking resemblance to the first of my cases that I cannot refrain from giving a brief description of it.

> A man of sixty was severely injured as a result of a building in which he was working falling upon him. A pubic dislocation with a fracture of the neck of the femur was the result. The man died about 12 years later, and the condition, for which he had during life apparently received no treatment, was found at autopsy to be as follows: The somewhat movable head rested upon the ileopectineal eminence directly under the skin and fascia, the artery and vein being to its outer side. Between the head and the bone, upon which the head rested, was an adventitious bursa. The broken end of the femur had dropped back and was fixed to the edge of the acetabulum by fibrous tissue, allowing some movement.

Flower's case also had certain resemblances to my first case, except that the fracture of the neck occurred while the

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[2] Fractures and Dislocations (1900, p. 755).

attempt was being made to reduce a pubic dislocation. The head was left "under the femoral vessels, so that the femoral artery could be felt pulsating over it. The limb immediately presented a dusky—I might almost say purple—hue from venous congestion, and became cold." The head of the bone was excised and the wound was soon healed.

I can find only two cases (Lauenstein's and Borchard's) of *fracture of the great trochanter associated with dislocation.* The cause of this fracture is not clear, although it is noteworthy that in both of these cases the dislocation was of the suprapubic variety. Lauenstein's patient fell 25 feet down the hold of a vessel, and Borchard's (a boy of fourteen) was run over by a roller drawn by horses. Both patients died, and in each case there was an autopsy.

It is not unlikely that fracture, especially such as does not interfere with the continuity of the bone, is a more frequent complication of hip dislocation than it is commonly supposed to be—a conjecture, the truth of which may perhaps be shown in the future by a careful Röntgen examination of all cases of hip dislocation.

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TRANSACTIONS

OF THE

AMERICAN SURGICAL ASSOCIATION.

Annual Meeting held in Denver, Colorado, June 19–21, 1911.

The President, RICHARD H. HARTE, in the Chair.

ADDRESS OF THE PRESIDENT.

THE TREATMENT OF FRACTURES OF THE LONG BONES.

The President, Dr. RICHARD H. HARTE, of Philadelphia, delivered the opening address, for which see page 289.

EPISPADIAS IN THE FEMALE AND ITS SURGICAL TREATMENT.

Mr. HAROLD J. STILES, of Edinburgh, Scotland, reported two cases of epispadias in the female, in which he had successfully transplanted the ureters into the pelvic colon. He described the nature of the deformity and traced its developmental pathogenesis. The incontinence of urine which resulted dated from birth and was diurnal as well as nocturnal. He recommended a routine examination of the vulva in all children suffering from incontinence of urine; if this were done he believed the condition would be shown to be less rare than was supposed. As regards treatment it was a comparatively simple matter to obtain a satisfactory cosmetic result by restoring the anterior commissure and uniting the two halves of the split clitoris. It was far more important, however, to get rid of the incontinence which resulted from the

imperfect development of the urethra and vesical sphincter. This Mr. Stiles had succeeded in doing by dividing the ureters close to the bladder, ligaturing the distal stump, and then transplanting the proximal ends into the lower part of the pelvic colon by the intraperitoneal route. Mr. Stiles described, in detail, the technic to be employed in order to avoid the two great dangers associated with the operation, viz., leakage and ascending kidney infection. His method consisted in implanting the ureters very obliquely into the bowel by a modification of the Witzel-gastrostomy principle. One ureter was transplanted at a time, three weeks or so being allowed to elapse between the two operations. In the first patient the right ureter was double, but this did not materially complicate the operation. Both patients made an uninterrupted recovery. The operations were done rather more than three years ago. The younger child, now six years old, had no incontinence during the daytime, but she occasionally wetted the bed during the night. The older child, now aged ten years, had no incontinence whatever, and did not have to empty the rectum oftener than every three or four hours. Both children were well, and there was no sign of kidney trouble. Mr. Stiles believed these were the first reported cases of epispadias in the female in which the ureters had been successfully transplanted into the bowel. He was not without hope that by adopting the method of uretera-intestinal implantation he had described as a preliminary step in the treatment of malignant disease at the base of the bladder, surgeons would be able to deal with cases which, up to the present, had been regarded as inoperable. The future of the surgery of malignant disease of the bladder (and possibly also of the uterus) depended on how far we were able to solve the problem of uretero-intestinal anastomosis.

Dr. John B. Murphy, of Chicago, Ill., remarked that epispadias in the female can be divided from a practical stand-point into three groups: the upward splitting of the clitoris; that involving the splitting of the urethra back to but not including the sphincter; that including the sphincter and giving incontinence. The first thing in connection with all cases is to take them very early. He believed that the failure to get good results in these cases is due not to the fact that the sphincter is not there, for it is there in every case, but because a sufficient liberation

of the walls of the bladder and of the base of the urethra is not made, in order to get an approximation of the layers of the urethra, before a condition of retention of urine in the bladder itself is produced. There should be a primary operation on the surface of the bladder and urethra before an attempt is made to close the bladder. In the type of epispadias in the female where the urethra has penetrated the clitoris and appears on the under surface of the symphysis with just a thin web between the urethral lining and the symphysis, an extensive dissection must be made to bring the bladder down and expose its neck for approximation.

Dr. Howard Lilienthal, of New York City, called attention to the method of Guiteras in which, after performing the sphincter work, a small sized rubber catheter is put into each ureter and kept there during the time of the healing of the plastic work above, thus obviating the constant flowing of the urine over the operated parts.

Dr. Charles H. Mayo, of Rochester, Minn., said that several times he had had to remove the bladder for malignancy in the adult. He had brought the ureters out into the back in two of these cases. It seemed to him this method described by Mr. Stiles opens up a wide field for cancer of the prostate and of the base of the bladder involving the trigone.

Dr. James E. Thompson, of Galveston, Texas, did not think a sufficient time had elapsed since Mr. Stiles operated on the cases he reported to say with any certainty that an infection will not pass up the ureter to the kidneys. He had seen two cases in which the ureters were transplanted into the pelvic colon; one patient did splendidly for three years and a half, was apparently in perfect health, then suddenly fell sick and died in three or four months: the postmortem showed the kidney riddled with abscesses. The other patient lived for about four years and a half, with the same fatal termination.

THE OPEN TREATMENT OF FRACTURES.

Dr. Edward Martin, of Philadelphia, Pa., presented a paper in which he discussed the treatment of transverse or nearly transverse fractures of the femoral shaft, the writer holding that thus the discussion might be more profitable, since there can be no

reasonable doubt but that for these fractures the plating method is far superior to all others. He pointed out the difficulty of reducing these fractures, and stated that in his experience he had never been able to overcome a deformity by continued traction with weights and pulleys when he had failed to do it immediately by manipulation and traction under an anæsthetic. It was also shown that by pull on the lateral ligaments and the fibrous septa attached to the inner and outer lip of the linea aspera the backward tilting of the lower fragment was usually produced. Stress was laid upon the importance of being provided with tools proper for an open operation upon this bone, and also upon testing the tools in order to see, for instance, that the drill was of the proper size for the screws. It was shown that the screws vary in size and pitch, and therefore that a number should be provided so that if one turns home hard another can be substituted. The indication for the open operation is failure to produce partial or complete apposition of broken ends. The incision recommended is one to the outer side of the rectus muscle, going through the cruræus and coming at once on to the fracture. The method of reduction is that which can be accomplished with the least stripping of periosteum and soft parts; sometimes an iron hook passed into the medullary cavity of the upper end of the lower fragment suffices, aided by longitudinal traction applied to the ankle, or when the lower fragment is tipped back by this traction, by applying the pull just below the bent knee. When the lower fragment cannot be hooked in position in this way it is advised to angle out the fragments, oppose them, and straighten the leg, thus using powerful leverage on the resisting muscles. When none of these methods are applicable, and this is usually the case in fractures of more than three or four weeks' standing, the middle of a canvas band is placed over the upper end of the lower fragment, to the long ends of this band are fastened from 100 to 200 pound weights, the band is prevented from angling out by direct pressure through gauze pads, and a wait of from five to ten minutes usually accomplishes not only complete reduction but a little lengthening. One-quarter of an inch should be obtained before the traction band is taken off. Sometimes more than 200 pounds pull is required. In old cases where the shortening is so great that it cannot safely be overcome by traction, resection of bone ends is of course indicated. Accurate

apposition very often requires the application of forcible pressure. Instruments were shown by which this could be accomplished; also instruments by means of which the broken ends of the bone are kept in proper position and the plate is held in place while the screw holes are being driven and the screws inserted. Experimental investigations have shown that two screws will hold a plate so firmly that it breaks before tearing loose, that the screws should not be nearer than ¼ inch to the broken ends, and that they need go through only one thickness of the cortex. A further investigation showed that the plates supplied vary greatly in strength, that some of them break under very slight force, usually at the screw hole nearest the fracture. For the purpose of correcting this Dr. Martin has had made by Lentz a vanadium steel plate about three times as strong as the ordinary plate, and further reinforced at the screw holes where breakage is liable to occur. This enables smaller plates to be used without any sacrifice of strength.

In conclusion Dr. Martin expressed himself as thoroughly in favor of operating on these cases under the indications given above. He believed that union was usually delayed and that this delay was proportionate to the amount of stripping of the periosteum and traumatizing of the soft parts. He believed if all the results of the present wave of enthusiasm for this method of treatment were published, it would not be regarded as creditable either to the surgeons or to the method itself. The major difficulty, given a clean operation, was in the matter of non-retention. In the case of other long bones this could probably be absolute; in the case of the femur it was practically never so. The slight recurring motions would inevitably loosen the screws. The best splint is plaster-of-Paris, which should be so cut when soft that the upper portion could be lifted off like a shell. This splint should extend from the foot to the axilla.

THE FIXATION OF OBLIQUE FRACTURES OF THE TIBIA BY MEANS OF EXTERNAL BONE CLAMPS.

Dr. Leonard Freeman, of Denver, Colorado, read a paper with the above title, for which see page 381.

Dr. John B. Roberts, of Philadelphia, Pa., strongly criticized the elaborateness of Dr. Martin's tools and their cumbersomeness,

and his proposition to pull down the lower fragment with a weight of 100 pounds or more! Equally good results can be obtained by the ordinary old-fashioned pulleys with Bucks' extension. He agreed with Dr. Freeman that pins such as he described do not as a general rule suppurate, and if suppuration should occur it can readily be controlled.

Dr. Thomas W. Huntington, of San Francisco, Cal., said that four years ago there were few of the leading surgeons in America who appreciated the merits of the open treatment of fractures sufficiently to discuss it. Now he had found on sending out a circular letter regarding this treatment that 93 per cent. of those to whom he had applied agreed as to the propriety and safety of the operative treatment of recent fractures in the hands of skilled surgeons. In dealing with recent fractures, the rules should be that the least possible foreign material must be placed under the skin. It does not necessarily affect the general question as to the propriety of operative procedure, that surgeons do now and then have to remove a plate, staple, or wire, but the least possible number of removals will tend very largely toward establishing the legitimacy of this undertaking. A point which he thinks of great importance is, that the further away from the skin one can place foreign material, the more the security that it will be retained permanently.

Dr. A. T. Bristow, of Brooklyn, N. Y., had operated nine times during the past winter by the open method for the treatment of recent fractures, and in every case the results were good. There is one point he thought worthy of attention in the after results. A surgeon operates, the patient becomes infected, the conclusion is that the infection is the result of the operation, failing in almost every instance to take into consideration the possibility of a pathogenic infection, a sore throat, etc. Very often the infection is hæmatogenous in character and not due in any way to the operative procedure.

Dr. Joseph Ransohoff, of Cincinnati, Ohio, did not believe that this open method of treatment should be generalized, for in his judgment it is one of the most dangerous operations in hands not thoroughly competent in everything pertaining to surgical technic. He had had one death himself years ago; knew of another from hemorrhage, and Dr. Martin told of another in his paper. A most important point is the time at which an operation should

be performed. It should be either at the time of fracture or at least within a week thereafter; the longer one waits the longer the deformity exists, shortened muscles and thickened periosteum develop, and the more difficult it becomes to reduce or wire, and the more difficult to keep the shortened muscles in extension. We cannot pull too hard on the femur, for it takes at least from 45 to 65 pounds to overcome the pull of the strong musculature around the thigh.

Dr. Fred B. Lund, of Boston, Mass., remarked that one reason why surgeons have not been more in favor of operating on the femur has been because they have not had the proper apparatus. He did not agree with Dr. Roberts that the tools employed by Dr. Martin were too cumbersome. Do not put on two plates where one will hold. The plates are good in fractures in old people and in those who will not wear cumbersome apparatus. He had operated on 12 cases; in two he had to take out the plates on account of suppuration, one three weeks after operation, and one 12 days. Both were cases of fracture of the forearm, which are very difficult to treat on account of the smallness of the bones. In plating the femur, a strong apparatus is required, although the size of the foreign body introduced should be just as small as possible.

Dr. Arthur Dean Bevan, of Chicago, Ill., did not believe at all in the routine employment of the open treatment for fractures, but does believe that this treatment has a very sure place in selected cases in the hands of experienced surgeons. It should be employed only in cases in which experience shows that a good, useful, functional, and clinical result cannot be obtained by less dangerous procedures. It cannot be stated too emphatically, however, that it should be employed only in selected cases, and that the operation should only be performed by men constantly doing surgical work, with every regard for the ordinary and extraordinary precautions as to asepsis, etc.

Dr. Alexander Primrose, of Toronto, Canada, said that a class of cases very applicable to this treatment is that of fracture at the upper end of the humerus where deformity is caused by rotation. By the open method it is a simple matter to rotate the arm, fix the plate, and restore the arm to a comfortable position. With regard to the use of the open method in compound

fractures, in an aseptic wound where there is sufficient drainage, the method is of value.

Dr. Arpad G. Gerster, of New York City, called attention to fractures, generally comminuted, involving the lower end of the humerus, of the T or Y shape, where one or both condyles of the humerus have been broken off in such a fashion that no amount of manipulation or fixation by the older methods will be sufficient to reduce the bones into the normal position, and so retain them. In several such cases he had found the plating of very great value; no disagreeable dressings were necessary; the union was very prompt.

Dr. M. L. Harris, of Chicago, Ill., had found the use of plates in compound fractures of the leg to be extremely useful. In the severe compound fractures ground full of dirt, in which there is certain to be suppuration, and which are extremely difficult to maintain in apposition by any method of dressing owing to the fact that they must be kept open and drained, he had used plates (knowing they must be removed later) to hold the bones in apposition. This forms a simple, easy fixation dressing with the wound open, thereby materially facilitating the draining of the wound and shortening the period of healing.

Dr. Stanley Stillman, of San Francisco, Cal., said that in very heavy individuals the necessity of plating a fracture of the femur is imperative. He used very small and light plates. In fracture of both bones of the forearm, if the bones are put in place there is not much tendency to displacement unless the fracture is very oblique. No man should undertake the open treatment of fractures unless he is a pretty good carpenter. In simple fractures where accurate and absolute apposition has taken place recovery is usually very slow; the amount of callus thrown out is slight; better and quicker healing is obtained where the apposition is not so accurate.

Dr. Charles A. Powers, of Denver, Colorado, remarked that there are at this time in all parts of the country a very large number of surgical operators, and he believed that in addition to the further improvement in operative technic there is room for more careful selection of the cases of fracture demanding operation. Surgeons should not lose sight of the established fact that a satisfactory or even perfect functional and cosmetic

result may occur in certain cases in which complete anatomical reposition is lacking.

Dr. Kenneth A. J. MacKenzie, of Portland, Oregon, said that his hospital service was largely an emergency service and he had quite an experience with fractures of the femur. He had been surprised to find in the majority of instances that the adoption of the plaster bandage, first devised by Stimson, had been the means of obtaining remarkably good functional results, even though examination with the X-rays showed the position of the fragments at times to be faulty.

EVERTED DORSAL DISLOCATION OF THE HIP: WITH THE REPORT OF A CASE MISTAKEN FOR FRACTURE OF THE FEMORAL NECK.

Dr. John B. Roberts, of Philadelphia, Pa., read a paper with this title, for which see page 371.

Dr. George W. Crile, of Cleveland, Ohio, remarked that the principal resistance to the reduction of dislocations, regarded physiologically, is the normal muscular tone and the muscular contractions due to the mechanical stimulation of the muscles in the course of efforts at reduction. These two obstacles in the way of a reduction may readily be overcome as follows: if the patient is anæsthetized with ether down to the level of ordinary surgical anæsthesia this method will not apply, but if the anæsthesia is continued until all the deep and superficial tendon reflexes are lost, until all normal muscular tone is lost, until a sharp tap upon the abdominal muscles with the finger is followed by no reaction, one can then take hold of the dislocated member and place the bone in position without any mechanical force at all. He had had opportunity of adopting this method in a few cases and had found it most successful.

Mr. Harold J. Stiles, of Edinburgh, Scotland, said that it seemed to him that if there is a dislocation of the hip-joint which cannot be reduced, be it congenital or acquired, the best thing to do is to remove the whole neck as well as the head of the femur, otherwise one will get an unstable joint afterwards. The neck of the bone will slide upward more and more, producing considerable shortening, whereas if one removes the whole of the neck and then rounds off the trochanter and places it in

the acetabulum, and puts the limb in the somewhat abducted position (which will compensate for the shortening), one will get a certain amount of stiffness, but will also get a stable limb.

OPERATIVE CURE OF INTERNAL HYDROCEPHALUS.

DR. E. WYLLIS ANDREWS, of Chicago, Ill., said that cases of acquired obstructive hydrocephalus are due to basal inflammations or other causes producing obstruction of the foramina of Leuschka, Magendie, or Sylvius. These, rather than congenital hydrocephalus, are the ones curable by operations. Operative treatment by drainage can be carried out from various sides, spinal canal, fourth ventricle, or lateral ventricles. The difficulty lies in making this drainage permanent without endangering the meninges from sepsis. The drainage of the ventricles must be into some absorbing cavity. The peritoneum, subcutaneous space, pericranium, and subarachnoid space have all been tried by V. Bergmann, Kocher, Keen, Ballance, and others. Cases were reported by Andrews in which gold or iridio-platinum tubes were made to connect the lateral ventricle and the subarachnoid space, causing permanent reduction of the distended ventricle. Rapid and permanent cure of one almost hopeless case followed the use of a light glass tube. The glass was used as less irritating and lighter substance than metal, and seemed to give better results. Skiagrams taken after five years showed the tube 2½ inches long exactly in the position placed by the operator. He therefore advocated the abandonment of all metals and the use of glass suitably molded in all these cases. It is absolutely inert to all chemical changes in the body fluids, and is safe against breaking inclosed in the skull. The fact that a 2½ inch tube can lie for years imbedded in the brain without causing symptoms or sensations is of clinical interest, and points to further possibilities in the use of glass objects in contact with tissue.

DR. LEWIS L. MCARTHUR, of Chicago, Ill., added that the idea came to him after reading an article by McBurney some years ago, that if instead of draining upon the skin surface of the body, as he had tried to do, he drained through the bony vault beneath the scalp into the cellular tissue of the neck, he would be enabled to secure a permanent drainage. He found a silver cannula, such as is used in the veterinary departments for milking cows, which having a small flange would prevent its dropping into the

skull, and would also prevent its falling out. He used this cannula with much success. The child, from being nervous and irritable, became much more normal in every way, although it died three years after operation from an intestinal complaint contracted during warm weather. He had operated upon two other cases after a similar manner also with good results.

Dr. George E. Brewer, of New York City, said that in 1898 he attempted in a case of internal hydrocephalus to drain the ventricle into the subdural space by the method of making a flap in the back of the head and exposing the posterior lobes, and above this space exposing the tentorium; then, by a puncture into the lateral ventricle he introduced a small filament of rubber tissue flared to make a number of strands which did not totally close; the flanged surface lay on the tentorium and the perpendicular portion entered into the cavity of the lateral ventricle. The child recovered from the operation but lived only six or seven weeks. The head diminished in size and the symptoms grew no worse. He tried the same method in two or three other cases, but did not feel that the results warranted his continuing in the use of it. He does believe that any method which will allow the fluid to pass from the ventricles into the subdural space will be found ideal.

Dr. Joseph Ransohoff, of Cincinnati, Ohio, said that he had tied the common carotid arteries in two children suffering from internal hydrocephalus, with most gratifying results. This method was first brought to his attention by the work of Mr. Stiles along these lines. With regard to the introduction of a foreign body to permit of permanent drainage of the ventricles, he thought a better method is that suggested by Brown. We have the roof of the lateral ventricle formed by a useless structure, the corpus callosum; this is very thin in all of these cases of distention of the lateral ventricle, and it is a simple matter to make a drill hole near the median line and through it pare off the corpus callosum, thus establishing efficient and permanent drainage without leaving anything in the interior of the skull to give rise to possible later trouble.

Dr. Charles Frazier, of Philadelphia, Pa., stated that he had recently been treating a case after the method of Mr. Stiles, by tying the common carotids. The child is still in the hospital, but a few days ago was in extremely good condition, having bene-

fited very materially by this treatment, which has now been conducted for several months.

MR. HAROLD J. STILES, of Edinburgh, Scotland, said that in congenital hydrocephalus there is no blocking of the passages at the fourth ventricle; indeed the foramina in the roof of this ventricle are much larger than normal. That being the case, he does not think any form of drainage can be expected to do good in congenital hydrocephalus. He had never derived anything but temporary benefits from such methods. In congenital hydrocephalus there is a disturbance between the balance which should normally exist between the secretion and absorption of the cerebrospinal fluid. The indication is to diminish the secretion by ligaturing the common carotids, the one a fortnight after the other. The operation should be done early in the disease. He had never found it to do any good when the hydrocephalus was associated with spina bifida. In acquired hydrocephalus the indication is to drain the ventricle, because these forms are due to obstruction.

SUPPURATION IN ONE HALF OF A HORSESHOE KIDNEY.

DR. JAMES E. THOMPSON, of Galveston, Texas, read a paper with the above title, for which see page 355.

DR. WILLIAM J. MAYO, of Rochester, Minn., said that in a number of cases of horseshoe kidney observed at the Rochester clinic, the symptoms were caused by anomalous blood-vessels. In the last year they had met with three cases of horseshoe kidney in which one-half was giving rise to trouble, but in only one case was the trouble sufficient to necessitate operation. The diagnosis, in other words, does not necessarily mean that the case must be operated. He recalled one case somewhat similar to that reported by Dr. Thompson. The patient, a girl of 16, had severe symptoms, had undergone various operations; she had a few urinary symptoms, although there was a certain amount of pus in the urine. The ureter was found drawn tight, and was plainly visible, but the posterior ureter leading to the other half of the kidney was buried so completely that it was difficult to find the division between the two parts. This fact made the operation much more difficult than it would otherwise have been.

DR. GEORGE E. BREWER, of New York City, said that the case of the author was similar to one he had recently had under his

care. The patient came into his service in a state of more or less chronic sepsis and with a discharging fistula, resulting from a previous abscess in the lumbar region. He gave evidences of an infected kidney. The ureteral catheter was attempted and the cystoscope, but the presence of a very grave cystitis and a contracted bladder prevented any satisfactory employment of these measures. Dr. Brewer operated and found a chronically infected kidney. The upper part of the kidney was distinctly destroyed, the lower part infected, but as he passed down toward the transverse portion it looked healthy. Not having had the advantage of a cystoscopic examination, he was at a loss to know whether both ureters were given off on the left side, or whether there was a single ureter on the other side. It took a good deal of time to dissect away the perirenal exudate to see that another ureter was present. Fortunately, the man made a very prompt recovery.

Dr. Kenneth A. J. MacKenzie, of Portland, Oregon, mentioned the case of a young woman, a Swede, who came into his service complaining of pelvic discomfort. He attempted an examination, and found what he thought to be a tumor, very dense and unyielding. Operation was performed, no ureters were found, there was no vagina, and this tumor could be felt below the sacro-iliac synchondrosis in the pelvis. Above he found an ovary floating in the abdomen, and pulling it down found it led to a Fallopian tube and a segment of the uterus. The tumor proved to be a tremendous ectopic horseshoe kidney. Huge vessels connected with it, and nothing could be done; there were some adhesions and he could not see where the vessels came from.

Dr. M. L. Harris, of Chicago, Ill., emphasized the necessity of conservatism in operating on horseshoe kidneys. Some six years ago he had a patient, a young woman 30 years of age, who was operated on for a movable kidney; this proved to be a mistaken diagnosis, a horseshoe kidney being found. There were two ureters coming from the pelvis, and the pelvis was on the concave side of the kidney and therefore dragged upward. The ureters were distinctly compressed, as they passed over the anterior surface of the kidney, and to this he attributed the existing dilatation of the pelvis. He attempted to free the ureters as they came from the kidney, and in order to do away with the sharp kinking or compression of the ureter he took

the perirenal fat and tucked it under the ureters to give them a large curve, and while doing this tore one of the renal veins, which was closed by suture. He then closed the wound. The patient made a very good recovery, and the attacks of pain ceased. About a year later she returned with distinct enlargement in the left side of the abdomen. Pus in the urine and tubercle bacilli were easily found. Knowing she had a horseshoe kidney, the question of what to do was a serious problem. He cut down on the left side, found a distinct pyonephrosis of tuberculous origin, and removed the left half of the horseshoe kidney. The patient made a good recovery and is now in perfect health. If anything radical had been done at the first operation on the right side of the horseshoe kidney there would have been no hope for the patient when the tuberculosis developed in the other side.

TREATMENT OF FISTULA IN ANO WITHOUT MUTILATION OF THE SPHINCTERS.

Dr. Kenneth A. J. MacKenzie, of Portland, Ore., read a paper with the above title, for which see page 360.

Dr. Thomas W. Huntington, of San Francisco, Cal., spoke of the importance of first dilating the sphincter ani in the exploration of anal fistulæ.

Dr. Charles H. Mayo, of Rochester, Minn., said that the injection of collargol into these fistulous sinuses is of great advantage in locating the inner tract into the bowel. In deep fistulous tracts running past the internal sphincter, undoubtedly many of them connect with low diverticuli; very recently he had seen two such cases, and he believed them to be much more frequent than is thought.

Dr. Arpad G. Gerster, of New York City, remarked that the most valuable part of the principle promulgated by the author was the avoidance of interference with the integrity of the sphincter, thereby preserving its function, which is accomplished by dividing the branches of the fistulous system from the source of supply of the infectious material.

THE CHOICE OF THE ANÆSTHETIC.

Dr. Arthur Dean Bevan, of Chicago, Ill., read this paper.

CHLOROFORM ANÆSTHESIA.

DR. JAMES E. MOORE, of Minneapolis, Minn., explained why he was not using ether as an anæsthetic after having used chloroform with perfect satisfaction for thirty years. He had had no sudden deaths or calamities; one case of acute yellow atrophy of the liver. He mentioned histories of two cases of death from yellow atrophy following ether as the anæsthetic. Death of a patient during or soon after operation from unknown causes is no proof that the anæsthetic caused death, but it usually gets the blame. Distinction should be made between death from anæsthesia and death during anæsthesia.

He originally chose chloroform because it was given then, as now, in the clinic he attended, by the drop method, and was efficient, safe, and comfortable, while ether, as given then, was disagreeable, tedious, and not free from danger.

The dangers from anæsthesia lie with the anæsthetizer rather than with the anæsthetic. Most deaths from all anæsthetics are due to the giving of too much of the drug, and chloroform being the more powerful is necessarily the more dangerous. Ether, as administered to-day on the open mask and by the drop method, is relieved of its former disagreeable features, and is safer than chloroform. Ether can be safely administered by a trained nurse, while no one but a graduate in medicine who has had special training should be allowed to administer chloroform.

The teaching of anæsthesia should occupy a prominent position in the curriculum of every medical college.

THE USE OF REBREATHING IN THE ADMINISTRATION OF ANÆSTHETICS.

DR. W. D. GATCH, of Baltimore, Md., read a paper, the conclusions of which were as follows:

1. Rebreathing, when properly regulated and when the oxygen supply is ample, is harmless and can be put to a valuable use.

2. If we can prevent anoxæmia, over-concentration of vapor and too great a depth of anæsthesia, we can obviate most of the serious objections to the closed method of giving ether.

3. The process of rebreathing prevents the elimination of ether and chloroform by way of the lungs, and over-ventilation of the lungs hastens the elimination.

4. It is suggested that after any administration of ether or chloroform over-ventilation of the lungs be brought about by the use of oxygen and carbon dioxide.

5. Morphia, or any drug which depresses the respiration, retards the elimination of ether or chloroform.

6. A method of administering nitrous oxide, and, if necessary, ether with oxygen, by the method of rebreathing, is described and its advantages and dangers discussed.

Its chief advantages are: (1) the rapidity and pleasantness with which anæsthesia is established; (2) the ease with which any depth of anæsthesia can be secured; (3) the prevention to a very large extent of post-anæsthetic vomiting, pulmonary complications, and abdominal distention.

Its chief dangers are: (1) anoxæmia, due to a failure to give sufficient oxygen, or to an obstructed air way; (2) impediments to the respiration, which in a long anæsthesia may exhaust the patient; (3) with cardiac cases, excitement during the period of induction.

EXPERIENCE WITH INTRATRACHEAL INSUFFLATION AS A METHOD OF ANÆSTHESIA.

Dr. S. J. Meltzer, of New York City. This paper, in the absence of the author, was read by title.

The essentials of the method of intratracheal insufflation consist in the deep introduction into the trachea of a flexible elastic tube, the diameter of which is much smaller than the lumen of the trachea, and the driving through this tube of a nearly continuous stream of air which returns through the space between the tube and the walls of the trachea. The distinguishing features of this method consist, first, in bringing pure air directly to the larger bronchi with the elimination of the dead space represented by the mouth, pharynx, larynx and trachea; second, the continuous recurrent air stream prevents the invasion of infectious material from the pharynx into the trachea. The usefulness of the method is threefold: first, by keeping up an efficient respiration in cases where the normal mechanism of external respirations fails; second, by overcoming efficiently the difficulties presented by double pneumothorax; third, it affords a safe and reliable method of anæsthesia, especially for the administration of ether.

The author cited a number of experiments where the insufflation anæsthesia lasted for hours, as long as twelve, without a single case developing any bronchitis or pneumonia which could be attributed to the anæsthetization; also experiments, which proved conclusively the impossibility of the inhalation of vomited material or blood from the pharynx. He then called attention to the difference between insufflation and positive pressure apparatuses, and how insufflation retains all the features of safety which the differential pressure does not do, for the life of the patient with double pneumothorax persists on a greatly reduced supply of external and internal respiration. The author then discussed the principles and methods of administering ether by this method.

FATALITIES, SIMULATING STATUS LYMPHATICUS, INDUCED IN NORMAL SUBJECTS BY INTERMITTENT ETHER ANÆSTHESIA.

Dr. Yandell Henderson, of New Haven, Conn., read a paper, which he prefaced by the statement that deaths under anæsthesia are usually either primary respiratory failure, or primary cardiac failure. The object of his paper was to show that the latter no less than the former are the result of unskilful methods of anæsthesia. Neither is necessarily due to any inherent hypersusceptibility in the patient. "Unsuspected heart disease" and "status lymphaticus" are usually mere excuses. Neither form of death is necessarily the result of anything done wrong by the anæsthetist at the time of death or for a few minutes previously. Both are really due to a hypersusceptibility developed in the patient by faulty methods at the beginning of anæsthesia. In particular a prolonged period of ether excitement or intermittency in the method of administering ether induces excessive respiration and diminishes the CO_2 in the blood. This acapnia may lead later to failure of respiration. The effects of acapnia upon the heart are equally deleterious—in some subjects even more deleterious. In such persons the heart fails first. These points were supported by comparisons of typical clinical cases with experiments in which animals were rendered acapnic by intentionally unskilful anæsthesia. It was found that in acapnic dogs under ether respiratory failure developed, while under chloroform primary heart failure resulted. Healthy cats after

being rendered acapnic by light and intermittent etherization (with no chloroform at all) often died suddenly of heart failure. Conclusion: " Individual hypersusceptibility," " unsuspected heart disease," and "status lymphaticus " are usually mere excuses for fatalities really due to light and intermittent anæsthesia.

Dr. John B. Roberts, of Philadelphia, Pa., said that death in general anæsthesia was usually due to poisoning from incompetent administration. Poisonous agents administered for any purpose should seldom be entrusted to non-graduates, in fact never unless the administration is supervised by a graduate in medicine. The hypodermic administration of morphine and atropin is well known to be in ordinary cases practically free from danger; it lessens the fear, which is an important factor in anæsthesia, lessens the amount of anæsthetic required, and, as proved by Claude Bernard thirty years ago, is good to use as a preliminary to general anæsthesia. With regard to the method of administration, he thought that of pouring a little of the ether upon a few layers of gauze full of holes, covering this with a closely woven towel to prevent too rapid loss of ether upward, increasing as it does the carbon dioxide rebreathed, is the simplest, best and most generally useful method of administration.

Dr. Charles A. Powers, of Denver, Colorado, remarked that in Colorado they had many tuberculous patients, and in his practice the anæsthetic used, as a general rule on such patients, is ether. He had always found it very satisfactory. In the present state of knowledge he believed that ether, given by the drop method, is the safest and most desirable general anæsthetic. There are comparatively few cases in which it is not well tolerated when carefully given. Applicants for positions in surgical departments do not make the best anæsthetists, for they are too much interested in the operations. He had a skilled anæsthetist who had no interest in the operative work of surgery other than such as may attach to seeing a patient safely through a given operation. When possible, he examines the patient one or two days before operation. He obtains the history, he makes a thoracic, and, when necessary, abdominal examination, he examines the urine and the blood. He learns the nature of the operation to be performed, and approximately its duration. When he gives the anæsthetic he knows the patient and the patient knows him. The patient is less apprehensive under these circumstances,

he or she feeling that the matter of anæsthesia is being given careful attention. The psychic shock is lessened, the importance of which was emphasized by Dr. J. Bapst Blake two years ago. He was rather apprehensive regarding the administration of the ethyl chloride compounds, and did not permit them to be used by any but highly skilled anæsthetists. Patients should wear, approximately, the same clothing while in bed in the hospital in which they are accustomed to sleep when at home; and they should be scrupulously protected from taking cold before, during and after the anæsthetic. The entire matter of anæsthesia should be made the subject of careful study at the hands of men or women especially adapted, temperamentally, to its administration. It should not be made, as is so often the case, a matter of chance.

Dr. Howard Lilienthal, of New York City, spoke with regard to intratracheal anæsthesia, with which he had had some experience, and which he had seen administered at the hands of Dr. Elsberg many times. The patient is absolutely quiet under this anæsthesia; there are not the usual signs of rattling and stertor in the throat as in other forms of inhalation anæsthesia; the breathing can be made as slow as desired, can be stopped altogether for some minutes if advisable; in operations upon goitres, cranial operations, chest operations, or any other operation except some upon the abdomen where it is at times difficult to overcome the rigidity, the procedure is the same as though operating on a person in a state of trance; the patient is entirely apneic, like a cadaver, except the vessels spurt when cut. In a large goitre, after the tube is in, everything is perfectly quiet, the patient does not have the customary spasmodic swallowing motions, and one can operate at his ease.

Dr. Leonard Freeman, of Denver, Colorado, confirmed the statement of Dr. Powers, that in Colorado ether was given with perfect confidence except in cases where tuberculosis is in an active state or very far advanced, and that no ill effects result from it. Whether this is due to the inhibitory influence of the climate and altitude or because ether does not disturb these cases, he was not in a position to state.

Dr. Fred B. Lund, of Boston, Mass., called attention to the use of local anæsthesia in cases of strangulated hernia. There is no way of giving a general anæsthetic in strangulated hernia

where the patient is constantly vomiting brown fluid (unless the intratracheal method would do it), without danger of the patient inhaling some of the vomitus. Strangulated hernia has lost its terrors since operations are done on the conscious patient under cocaine. He fully agreed with Dr. Lilienthal's remarks on intratracheal anæsthesia, and believed it has a great place, especially in head and neck operations. He also believed that spinal anæsthesia has a place in amputation of the legs in diabetic patients.

Dr. Charles N. Dowd, of New York City, said that his experience with the intratracheal insufflation method of anæsthesia has, like that of the former speakers, been most satisfactory in every case. With regard to the question of status lymphaticus he remarked that most of these cases occur in children, and he believed are in truth due to faulty methods of administration. Children are particularly susceptible to anæsthesia, and it is not an uncommon thing for a person skilled in giving anæsthesia to adults to get a child so deeply anæsthetized as to produce this condition called "status lymphaticus." Children should be most carefully anæsthetized, and an anæsthetist who does not understand the difference between administering a general anæsthetic to a child and to an adult should not be allowed to take charge of children's cases. All surgeons have gone through the period where the junior on the house staff of the hospital gives the anæsthesia under slipshod instruction. Personally, he had obtained the best results where a nurse has been thoroughly instructed and gives the anæsthetics for months and years. The difficulty in many hospitals at the present time in having a professional skilled anæsthetist is the question of additional expense to the hospital; but he felt sure that the managers of such hospitals will soon see that it is due both to the patients and to the operating staff to install a different regime.

Dr. Joseph Ransohoff, of Cincinnati, Ohio, remarked that the only death that he would consider absolutely with justification attributable to anæsthesia is the one occurring before the surgeon has used the knife or applied a ligature to any vessel. With regard to spinal cord anæsthesia, he had used it a good deal and considered it has a very definite place in cases with bad kidneys, hearts which could not safely be entrusted to ether or chloroform, and in cases of diabetic gangrene requiring amputation.

Dr. Thomas W. Huntington, of San Francisco, Cal., said with regard to spinal cord anæsthesia, he had used it a great deal with most gratifying results both to himself and to his patients. It must, however, be remembered that the death rate from spinal anæsthesia when used as a *routine* measure is too great to warrant its employment except in selected cases.

Dr. Robert G. Le Conte, of Philadelphia, Pa., said that just before coming to this meeting he removed the leg from a patient suffering from diabetic gangrene, and as usual in such cases found the employment of spinal cord anæsthesia most satisfactory. This form of anæsthesia has a very limited field, but under certain conditions, such as mentioned by the former speakers, he considered it the safest anæsthetic.

Dr. Arpad G. Gerster, of New York City, said that he was brought up in the chloroform school and used it for many years in his surgical practice, but finally abandoned it for ether because of the uncertain and unreliable administrations of it at the hands of changing anæsthetists. He now restricted its use to those cases only in which it is especially indicated, other forms of anæsthesia being contraindicated. He had found spinal anæsthesia useful many times, and agreed that, although limited, its field is very definite. With regard to the administration of anæsthesia, he was taught in Billroth's clinic to be most careful in administering an anæsthetic to those patients who showed signs of fear at the time of administration. He never realized fully until hearing the papers of Dr. Crile and of Dr. Henderson just why this precaution was necessary, although he had been careful to teach the same precaution to his own students.

Mr. Howard J. Stiles, of Edinburgh, Scotland, spoke in defence of chloroform. Dr. Henderson's paper gave an explanation of why it is safer to have chloroform administered by a person not afraid of it. It is a good thing, and advisable in this country, that ether should take the place of chloroform, because American surgeons are afraid to give enough chloroform. Since a visit to Dr. Mayo's clinic five years ago he had become a partial convert to ether, and now uses it in 75 per cent. of his cases, because he recognized that it was safer than chloroform. Personally, he was not afraid of chloroform on the operating table, if it is given by a man who knows how to give it and is not afraid of it. He was afraid, however, of its after effects.

He had had about 12 cases of delayed chloroform poisoning. What is the relation between delayed chloroform poisoning and sepsis? If the sepsis originates in the abdomen the liver has to deal with the poisons. Suppose a gangrenous appendix is removed under chloroform; what happens? The bacterial toxæmia is intensified by the chloroform which is the last straw, and the patient dies. The moment he stopped giving chloroform in acute appendicitis his results showed a very striking improvement. There are certain conditions, however, in which chloroform is indicated. For instance, in alcoholic patients, in operations in which there is likely to be considerable loss of blood, and in operations in which it is important to work with haste. Personally, he always used chloroform in breast cases in preference to ether, because there is but half the amount of bleeding, and consequently the operation can be done comfortably within an hour. With regard to the special apparatuses for the administration of anæsthetics, even if they are a little cumbersome, if one can get a better and safer anæsthesia, it is a duty to employ them. It had been his privilege to see Dr. Elsberg's apparatus used in Dr. Meltzer's intratracheal method of administering ether, and he was very much impressed with it. It was the simplest, smoothest, and most delightful anæsthesia he ever saw. He was also favorably impressed with the nitrous oxide and oxygen anæsthesia, which he saw both at Johns Hopkins and at Dr. Crile's clinic.

Dr. C. B. G. de Nancrede, of Ann Arbor, Mich., said that there was one point in regard to the use of ether as a general anæsthetic which had not been mentioned. In military service it is absolutely impossible to give ether after a big battle. Enough ether cannot be carried in the first place, and the surgeon cannot take the time to properly administer it in the second place. Again, if it is a hot climate, in the tropics, it is extremely difficult to get a patient under ether; it is very difficult even in this country when it is very hot to get some patients under ether. He had no hesitancy in saying, after forty years' experience with anæsthetics, that he preferred ether to any other general anæsthetic, but he did not confine his practice to its sole use. And in the class of cases mentioned above, he was of the opinion that chloroform should be employed.

EXTIRPATION OF TUMORS OF VOMER THROUGH THE ROOF OF THE MOUTH.

DR. CHARLES H. MAYO, of Rochester, Minn., read a paper with the above title, for which see page 302.

DR. ALBERT E. HALSTED, of Chicago, Ill., had operated on a number of these cases. The first method he tried was the one described by Feidallot, the temporary resection of the alveolar processes of the superior maxilla dropping down near the hard palate. That operation gave an excellent field to work through, but caused a great deal of deformity, and the after results were not satisfactory, it being difficult to replace and keep the bone in place. The second method was the one he later adopted for the removal of the hypophysis, known as the Loewe method; an incision is made underneath the lip, and the lip turned up toward the top of the head. This method also gave an excellent view of the tumor, and made it extremely easy to work in the nasopharynx. The third time he tried a method of splitting the palate and removing the tumor through the mouth. The difficulty with this method was that a necrosis of the hard palate resulted and he could never afterwards close the opening completely. Therefore, from his experience, he strongly advocated the method of Loewe for the removal of tumors of the vomer.

ARTERIOVENOUS ANASTOMOSIS FOR GANGRENE OF THE LEG.

DRS. ALBERT E. HALSTEAD and ROGET T. VAUGHAN, of Chicago, Ill., presented a paper on the above subject, the conclusions of which were as follows:

1. There is experimental evidence to show that in animals the circulation through the large veins of the extremities may be reversed, and that it is possible for the normal blood-pressure in the arteries to overcome the resistance of the valves of the veins.

2. Experimental and clinical evidence show that the anastomotic opening is not permanent, but that gradual obliteration takes place in event of the failure of early occlusion by a thrombus.

3. There is not sufficient clinical evidence to be deduced from the reported cases to show that the pressure of the blood in

the arteries in the cases operated upon was sufficient to force the valves in the veins.

4. It is also shown by the cases reported that early occlusion of the vessels about the anastomotic opening by a thrombus was the rule, and in many the opening never at any time functionated.

5. In event of the arterial blood forcing the valves in close proximity to the anastomotic opening, it returned through the communicating veins and did not traverse the capillaries as a rule.

6. A study of traumatic arteriovenous aneurism shows that with a normal arterial pressure it requires weeks or months for the valves in the communicating vein to be overcome, as is evidenced by the gradual development of varicosities and the long delayed pulsation in the veins remote from the seat of aneurism. Under these conditions, the arterial blood supply is maintained partly through the usual collateral channels which are unobstructed. In cases of gangrene from obliterating diseases of the arteries, the collateral vessels are already occluded. In such a case immediate reversion of the circulation is imperative. This cannot be accomplished because, (1) of the obstruction offered by the valves; (2) in many cases the circulating blood must overcome the resistance offered by the thrombosed vein; (3) the blood will return often through the nearest communicating vein—and will not reach the peripheral capillaries.

7. Their final conclusion was that there is but one indication for the application of arteriovenous anastomosis in surgery; that is, in traumatic destruction of a principal artery, where end-to-end union of the vessel is impossible. In such a case arteriovenous anastomosis might be attempted, and through it we might maintain a sufficient blood supply to preserve the integrity until an adequite collateral circulation was established.

Dr. Howard Lilienthal, of New York City, expressed the opinion that there are certain cases of diabetic gangrene in which the arteries are not diseased where arteriovenous anastomosis will be found practicable. Where both arteries and veins are diseased it naturally does no good to anastomose one diseased vessel with another.

Dr. Fred B. Lund, of Boston, Mass., had had some experience with arteriovenous anastomosis and had never found it of

value. He agreed with Dr. Halstead that it has a very limited field of usefulness. Dr. Buerger, of Boston, has made some beautiful pictures of the venous distribution in the leg, and it has been found possible with healthy vessels to perform a satisfactory arteriovenous anastomosis, but the cases in which its employment is indicated are very rare.

Dr. John B. Murphy, of Chicago, Ill., called attention to the anastomoses that have been formed by bullet wounds and stab wounds. He recalled one case of anastomosis of the jugular vein with the carotid artery caused by a bullet, in which he closed the opening with suture and a perfect result followed.

PYLOROPTOSIS: GASTRIC ATONY AS THE ORIGINAL CAUSE OF NEURASTHENIA AND ITS CURE.

Dr. Archibald MacLaren, and Louis E. Daugherty, of St. Paul, Minn., read this paper, for which see page 306.

Dr. Stanley Stillman, of San Francisco, Cal., was heartily in accord with the point made by Dr. MacLaren that these cases usually are not such as to warrant surgical interference. He had found the results of operation upon them to be most unsatisfactory. The stomach is hung quite low, and the medical men naturally insist that this calls for drainage and the surgeon is strongly urged to operate, but Dr. Stillman's advice is to leave these cases entirely alone surgically.

Dr. William J. Mayo, of Rochester, Minn., also agreed that operations upon these atonic stomachs in neurasthenic individuals are seldom, if ever, followed by satsfactory results lasting for any length of time. It is possible, as the author mentions, to obtain a temporary relief in some cases from the symptoms, but this does not last long. This holds good with almost any operation upon neurasthenics. Is it possible that there may be secreted in the colon some toxin which, when absorbed, produces these gastro-intestinal disturbances, comparable in some manner to the effects of hyperthyroidism? Finney reports three cases in which by resection of the transverse colon his patients apparently got a good deal better, and Dr. Joseph Blake also reported some carefully selected cases that were benefited through operations on the colon.

Mr. Harold J. Stiles, of Edinburgh, Scotland, said that he had always been able to obtain quite satisfactory results on these

cases by doing a gastro-enterostomy with a good big opening, closing off the duodenum. With regard to chronic constipation he had always felt that it is one of the causes of atonic dilatation of the stomach. Chronic constipation acts upon the stomach in the same way that hypertrophy of the prostate acts upon the pelvis of the kidney. There is practically an intermittent obstruction; there is no escape or insufficent escape at one end of the bowel, yet the patient is continually pouring liquid and food into the other end; the result must be a backward pressure, a damming back of the fluid in the small intestine into the duodenum, and a dilatation of the pyloric end of the stomach. When that occurs—and in practically all chronic dilatations it is found that the pyloric sphincter is absent or nearly so—a stomach stasis occurs. The patient does not, therefore, get properly nourished, and so becomes neurasthenic. By allowing the food to escape from the stomach more readily the primary digestion and the nutrition of the patient will be so improved that the neurasthenia will gradually disappear. His experience had been that there is a distinct tendency to improvement in constipation by doing a gastro-enterostomy and closing the duodenum.

ULCER OF THE STOMACH AND DUODENUM WITH SPECIAL REFERENCE TO THE END RESULTS.

Dr. William J. Mayo, of Rochester, Minn., presented this paper, for which see page 313.

Dr. John E. Summers, of Omaha, Nebraska, said that in a recent case of gastric ulcer, the ulcer being adherent to the posterior wall of the stomach, the patient had pain in the dorsal region. He had found such pain complained of by other patients suffering from gastric ulcer. In about 58 per cent. of all cases of fatal hemorrhage from the stomach the hemorrhage comes from the splenic artery through ulceration. The splenic artery at times, as he had verified by personal experience, does not run along the upper border of the pancreas, as described in the text-books, but within the upper part of the pancreas itself. In the loosening of these adherent ulcers of the posterior wall of the stomach, great gentleness should therefore be exercised, because otherwise one might possibly in the upper part of the pancreas meet with the splenic artery and bring about a fatal termination through rupture and subsequent hemorrhage.

SOME MODIFICATIONS OF TECHNIC IN THE SURGERY OF THE GALL-BLADDER AND BILE-DUCTS.

Dr. John E. Summers, of Omaha, Neb., read this paper, for which see page 110.

Dr. Lewis L. McArthur, of Chicago, Ill., seconded Dr. Summer's remarks regarding the minimum of surgical interference in cases of acute septic gall-bladders. So much better results are obtained by the method he outlines that it should appeal to everyone. The utilization of the bowel tract, which has been opened and drained, as a drain for relieving the kidney from colemic sepsis and other conditions dependent upon long continued biliary trouble, had proven in his hands of so great value that he urged those who had never tried it to do so. In those cases in which the common duct is being drained, insert the drainage tube into the common duct an inch or so downward, instead of, as heretofore practised, upward toward the liver, With the tube inserted in this way an ordinary ureteral catheter can be passed into the common duct and will find its way readily into the duodenum, and irrigation of the intestinal tract can be easily accomplished. Nourishment can also be administered, when necessary, through this channel.

Dr. Charles H. Mayo, of Rochester, Minn., heartily agreed with all Dr. Summers had said regarding the treatment of the gall-bladder and bile-ducts, and particularly to the necessity for the careful treatment in septic cases. He had had good results from the use of salt solution washed through the cystic and common ducts into the intestines.

BOOK REVIEWS.

BISMUTH PASTE IN CHRONIC SUPPURATIONS. By EMIL G. BECK, M.D., Surgeon to the North Chicago Hospital. 8vo, pp. 237. C. V. Mosby Co., St. Louis, 1910.

It is now some six years since the author noticed that a tubercular sinus which he had injected with a bismuth and vaseline mixture for diagnostic purposes closed and remained so. The results which have accrued to the department of surgical therapeutics from that seemingly accidental observation have been so notable that the publication of a monograph on this method of treatment of persistent sinuses by its originator is very acceptable.

In it we find a graphic recitation of Dr. Beck's personal experience and the gradual development of the art of bismuth treatment, as one after another the various regions and organs in the body have been attacked.

The book is profusely illustrated, and consideration of these plates alone should indicate to us our absolute inability to diagnose certain lesions without the aid of bismuth paste and the X-ray. Further reason for the general adoption of this method is found in considering the fact that not only are diagnostic errors revealed but curative treatment is applied at the same time.

The author states that he believes the reason for cure of these sinuses, especially those of tubercular nature, is due, first to the destruction of the tubercular bacilli by the chemotactic properties of the bismuth subnitrate; second to the mechanical dilatation of the walls of the sinuses; and third to exposure of the injected sinuses to the X-ray.

Some consideration is also given to the lately developed art of stereoscopic radiography. The formulas and methods of administration in various conditions are given in a thorough and terse manner.

To those having patients with persistent sinuses, the treatment as described by Dr. Beck is sincerely recommended, and a thorough and comprehensive consideration of it is to be found in this admirable monograph.

DISEASES OF THE ANUS, RECTUM, AND SIGMOID. By SAMUEL T. EARLE, M.D., Professor Emeritus of Diseases of the Rectum, Baltimore Medical College. Philadelphia and London: J. B. Lippincott Co., 1911.

The author has obviously endeavored to prepare a book on this most important subject which may be used as a reference for general practitioners and students rather than the proctologist. He has succeeded in incorporating in it the great majority of approved procedures which have been developed in the treatment of the pathologic conditions in this region.

Minor differences in pathology and malformation have been omitted, types having been offered which simplify and make easy quick reference. Minor steps in operative technic have likewise been intentionally and justifiably omitted. The text is well illustrated by instructive cuts and line drawings, which go far toward elucidating and simplifying the subject matter. The general subject is well covered, and the book will be appreciated as a valuable addition to our literature.

DISEASES OF THE PANCREAS, ITS CAUSE AND NATURE. By EUGENE L. OPIE, Professor of Pathology, Washington University, St. Louis. Second Edition, pp. 387, 44 illustrations. Philadelphia: J. B. Lippincott Co., 1910.

Since Claessen in 1842 put forth the first monograph on this subject, the knowledge of physiology and pathology has been very progressive, but until the last decade interest was confined chiefly to research and pathological laboratories. The previous edition of this work, which appeared seven years ago, collated the observations of contemporaneous investigators and elucidated many obscure problems pertaining particularly to the diseases dependent upon the peculiar physiology of the pancreas, namely, hemorrhagic necrosis or acute hemorrhagic pancreatitis, fat necrosis, and diabetes mellitus.

While the experimental aspect of these problems has continued to receive marked attention, the greatest advances in our knowledge of this organ and its diseases have been through the observations of surgeons and the pathologic findings in the living tissues, which have so markedly altered many of the views previously formed from autopsy records.

Thus we have been able to diagnose even grossly between

interlobular and interacinar types of fibrous tissue proliferation, and similarly the clinician can now distinguish between the same types in a majority of instances. The author regards the diagnosis from the view-point of a pathologist rather than that of a clinician, and exceptions will be taken by some observers to the statement on page 243 that "chronic pancreatitis is rarely accompanied by such definite symptoms that its recognition is possible during life," because when the laboratory worker and the clinician are able to work together in full knowledge of what each has found, practically 80 per cent. of the cases may be diagnosed and in many instances even the type of pathologic change surmised.

The most interesting chapters in the book are those on hemorrhagic necrosis, chronic pancreatitis with its subdivisions of the interlobular and interacinar types, and the one on the pancreatic pathology of diabetes mellitus, into which the author has gone with much detail. His adherence is remarked to the former views which he held regarding the essential lesion in the cases being found in the islands of Langerhans. The various theories of the other men are, however, freely discussed. Indeed, throughout the entire work one finds a wealth of references to the literature and a full appreciation of the work and observations of the other experimenters.

Atrophy of the pancreas is not considered very fully except in the references to Hansemanns's work; however, this is one of the very recent advances and will doubtless be mentioned more in detail later.

The book is authoritative, well illustrated, clearly written, and presents very well the great advances which have been made in this subject to date. JAMES T. PILCHER.

A MANUAL OF GYNÆCOLOGY. By THOMAS WATTS EDEN, M.D., F. R. C. S., Edin. 632 pages, 272 Illustrations in text. Philadelphia, P. Blakiston Son & Co.

This is a manual of gynæcology, not a formal treatise, and in the preface the author says, "the object with which the manual has been written is to provide students and general practitioners a complete but not exhaustive account of the diseases of women in their pathological and clinical aspects . . . . Subjects at

present imperfectly worked out have been dealt with by eliminating speculative matters. . . . ."

The volume is divided into fifteen parts. Part I treats of anatomy and physiology of the female genital organs; II, methods of examination; III, certain prominent gynæcological symptoms; IV, disorders of menstruation; V, morbid conditions of the uterus; VI, morbid conditions of the ovaries; VII, morbid conditions of the Fallopian tubes; VIII, extra-uterine pregnancy; IX, morbid conditions of the vagina and vulva; X, malformations; XI, major gynæcological operations; XII, after-treatment of major operations; XIII, therapeutical notes.

For clear, logical, and comprehensive statements, there is little to be desired, and the illustrations accompanying are of a high order, and taken together serve admirably to enforce the author's teachings. The illustrations showing the relations of the vagina, bladder, and rectum follow the old methods by showing each as a distended organ, which is not in keeping with Nature's facts in the case. Notwithstanding these minor defects, which are not peculiar to the author, they do not mar the general accuracy of statement.

The student or practitioner who familiarizes himself with the teachings of this manual and has the technical ability to carry them into actual practice will rank as a competent gynæcologist.

The work is a credit to the genius and learning of its distinguished author.

WALTER B. CHASE.

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FIG. 1.

Fracture of pisiform bone of right hand; supine position; fracture at X.

For insertion in August, 1911, issue opposite page 229.